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Sulfuric Acid Down 3% During 1958, U.S. Report States

Both Production and Shipments Off Slightly As Compared to 1957

WASHINGTON — Production of sulfuric acid in the U.S. during 1958 totaled 15,950,199 short tons (100% H_2SO_4) which marked a 3% decrease from the 1957 figure, according to a preliminary report released June 12 by the U.S. Department of Commerce, Bureau of the Census. The tonnage for 1957 was 16,459,608 tons.

The report states that about 89% of the 1958 output was produced by the contact process compared with 88% of the 1957 total. The value of materials shipped in the respective years is reported as being $158,767,000 for 1958 and $162,422,000 the previous year. These figures are f.o.b. plant, the report notes.

Shipments, like production, were down 3% in 1958, the figure being 9,366,917 tons as compared to 9,689,989 tons the year before. Shipments for 1956 and 1955 were both greater than those of 1957, according to the report.

The Bureau of the Census says that the 1958 statistics were compiled from data reported by 216 plants including those owned by the federal government. The compilation was prepared by Reese R. Morgan, in the industry division under the supervision of Cyril M. Wildes, chief, chemicals and wood products and Jack J. Gottsegen, chief, chemicals.

$1¼ Million Set for Forest Insect Control

OGDEN, UTAH — Floyd Iverson, regional forester, reports $1¼ million will be expended by 1961 to protect national forests in Idaho, western Wyoming, Utah and Nevada from outbreaks of tree-destroying bark beetles.

Where possible, he said, the infested trees are logged by private lumbering concerns, but usually these trees are too scattered to log economically. The U.S. Forest Service must then employ chemical control, he said.

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Construction of New SunOlin Plant Begun in Delaware

NEW YORK — Construction began June 22 on the $8 million urea plant being built at North Claymont, Del., by SunOlin Chemical Co., an affiliate of Sun Oil Co. and Olin Mathieson Chemical Corp. The beginning of construction was marked by a simultaneous press conference in New York attended by officials of the firm and members of the press.

An exact scale model of the new plant was unveiled at the conference, giving visitors an opportunity to ask questions about the operation of the facilities. The model, valued at $30,000, was developed by M. W. Kellogg Co. who will construct the plant. The model is expected to save significant time and money in actual construction of the unit, and will also be used in familiarizing key personnel with the layout.

James I. Harper, SunOlin president, said the plant is scheduled for completion late in February. It will employ about 40 persons and will produce some 73,000 tons of urea annually, plus approximately 10,000,000 cu. ft. hydrogen to be used by Sun Oil to produce ammonia and for other refining processes.

S. S. Johnson, vice president, said

(Turn to SUNOLIN, page 17)

Wildlife Service Backs Legislation to Increase Pesticide Research Fund

WASHINGTON — The Fish and Wildlife Service, U.S. Department of Interior, has endorsed HR 5813 increasing pesticide research funds from $280,000 to $2.5 million per year.

Approving the pending legislation, the service said investigations already made "clearly indicate a problem of much greater magnitude than originally contemplated . . . that existing authorization is inadequate."

Four objectives of the increased program were listed by Ross L. Leffler, assistant secretary of interior. They are:

(1) To determine the acute and chronic toxicities of some 200 basic pesticidal chemicals plus those now being developed.

(2) To conduct chemical analyses of plant and animal tissues to determine pesticide residues, develop diagnostic procedures to determine suspected poisonings, measure degree and duration of toxic conditions in fish and wildlife habitats.

(3) Carry out field appraisals of immediate and long range effects of pest control operations on wildlife populations.

(4) To facilitate communications to personnel directly responsible for programs.

Mr. Leffler said that some of the dangers arising from control operations are danger of chemicals to food chain organisms, dangers of excessive dosages and effects of pesticides on wildlife reproduction and on commercial inshore fish and shellfish operations.

He stated that one sixth of U.S. cropland and millions of acres of forests, rangelands and marshlands are treated annually with pesticidal chemicals.

Searchers Take to Air to Look for Soybean Nematodes

WASHINGTON — An airplane is being used this year in Mississippi, Louisiana and Arkansas to speed a federal-state survey for the soybean cyst nematode, the U.S. Department of Agriculture reports. Surveys are planned in all the major soybean-producing states.

An observer in the plane watches for signs of nematode damage—yellowish spots and sparse growth. If symptoms are found, ground crews go into the soybean fields, sample soils and examine roots of the stunted plants for nematodes. Surveyors seek especially to find the outer

(Turn to NEMATODES, page 17)

Victor Chemical Announces Plans for New Phosphoric Acid Plant in South Chicago

CHICAGO—Plans for a new phosphoric acid manufacturing facility on Chicago's far south side have been announced by Victor Chemical Works. Rothe Weigel, president, said the new plant will be located on a 35-acre tract on the south bank of the Little Calumet River at 138th St. Cost of the new unit was not disclosed by Victor.

The proposed facility will be Victor's ninth manufacturing unit. The first portion of the plant will be for the manufacture of phosphoric acid. It is expected to be completed early next year. A second phase, now under study by the company, will include facilities for making phosphates for industrial purposes.

Capacity of the new units will supplement Victor's plant at Chicago Heights where the company has had a production facility since its founding in 1896.

Mr. Weigel said the waterway site was selected with "multiple transportation availability in mind both from the standpoint of incoming raw materials and shipping our products."

In addition to superhighway routing provided by the nearby Calumet Expressway, Mr. Weigel said frontage on the Little Calumet River gives the plant easy access to ocean shipping via Lake Calumet Harbor.

The river is the link connecting Lake Calumet with the Cal-Sag Channel.

"Thus, we shall be able to receive shipments of raw material and to ship finished products over the Illinois, Mississippi, Ohio and Missouri waterways as well as to customers at all Great Lakes points and into the new St. Lawrence Seaway to Canadian and overseas destinations," Mr. Weigel said.

New Screwworm Infestation Discovered in Florida Area

— More Insect Notes Page 4 —

WASHINGTON — Screwworms—target of a federal-state eradication effort — were discovered infesting livestock June 17 near Lake Placid in Highlands County, Florida, the U.S. Department of Agriculture and the Florida Livestock Board have announced.

This is the first screwworm case reported in the southeastern U.S. eradication area since Feb. 19. However, flies trapped in other areas of Florida following this date were suspected of being screwworm flies.

Release of sterile screwworm flies —key to the eradication effort—was greatly increased on the farm where the infestation occurred, and in adjacent areas, to prevent further infestations. Livestock on the farm was sprayed with an insecticide. Surveys have been intensified to determine if further infestations exist.

Eradication program leaders emphasized that occurrence of this case points up the necessity for livestock producers in the Southeast to be on the alert for any suspected infestations and to report such cases immediately. Success in eliminating the screwworm from the Southeast depends upon this close cooperation by livestock producers. Samples of eggs or larvae must be positively identified by specialists.

The present effort, including the release of 50 million sterile flies weekly, will continue until it has been determined that the screwworm has been eliminated from the Southeast.

AT TESTING PLOTS—The relation of soil testing to fertilizer responses obtained on Washington outlying testing plots is discussed by Darrell Turner (left), Washington State College extension soils specialist; Trevor Steele, American Potash and Chemical Co., LeVerne Freimann, Whatcom County extension agent, and Dale Massie, Cominco Products, Inc.

Agronomy Problem Tour Seeks Answers to Farm Difficulties

"Why does this alfalfa field look so yellow?" "Can we hope to grow Ladino clover on this particular soil?" "Should nitrogen be applied to pastures in March during a rainy spring?" "Should we fertilize old pastures that do not contain the proper species?" These were a few of the questions that LeVern Freimann, county agent for Whatcom County, Wash., threw out to a group of technical personnel who visited his area recently.

"Research at the various experiment stations has given us answers to many of our agronomic problems," Mr. Freimann stated, "but we still have many problems in the field that await solution. Instead of looking at all the good fields, and excellent fertilizer responses that we have on many farms, today we are going to have an 'agronomic problem tour'."

The group which attended the agronomy and outlying testing tour in Skagit and Whatcom counties was composed only of technical personnel from college and industry. Experiment station superintendents, extension specialists, industry agronomists and county agents discussed with enthusiasm the possible solution to the area's difficulties.

One of the major stops on the tour was the college outlying testing plots. These pasture and hay fertility plots are detailed randomized fertility plots placed right out on the farm for maximum benefit. These types of demonstrations are financed in part by the National Plant Food Institute as part of its over-all program to encourage field fertility plots.

As Darrell Turner, Washington State College soils specialist, explained, "One of our big problems on these plots is to maintain a proper balance between Ladino clover and orchard grass. The dry spring and summer of 1957 all but eliminated the Ladino on these plots, and consequently our major fertilizer response is to nitrogen."

Mr. Turner said that keeping Ladino clover in irrigated pastures was not a simple problem and that they had the same difficulties in other areas on irrigated pastures. "Unbalanced fertilizers, low soil temperatures, lack of soil aeration, grass competition, low soil moisture, and other unknown factors cause Ladino to disappear from many pastures long before it should," Mr. Turner stated.

The group looked at a "problem alfalfa field." The farmer had had his soil analyzed and an appropriate fertilizer containing boron was added early in the spring. The field looked quite poor. Plant samples were dug up for nodule examination, the soil profile was exposed and plants were examined for deficiency symptoms.

C. B. Harston, soils extension specialist, suggested that lack of sulfur might be the problem. Mr. Freimann agreed to have the farmer put out two strips using gypsum on one, and sulfate of potash on the other.

Several stops were made to examine some Northwest strawberry plantings. Some of the three-year-old fields were poor, some very good. Mr. Freimann explained that the difference in the fields was largely due to good and poor management. Those farmers who have applied good management practices to their operations such as fertilization, weeding, cultivation are in good shape. "Those who neglected their fields because of low prices are getting in trouble," he stated.

Growth Regulators Increase Berry Size

SALEM, ORE.—Growth regulator sprays have increased the size of Evergreen blackberries in the last two or three pickings. That's the report from most of the Marion County blackberry growers who have used materials containing Beta-naphthoxy-acetic acid and Pra-chloro-phenoxy-acetic acid.

"The chemicals were tested as early as 1950 by Quentin Zielinski and Ralph Garren, both Oregon State College horticulturists," says D. L. Rasmussen, county extension agent. "Results have been good except in cases where soil moisture is low. This has made it impossible for the Oregon Agricultural Experiment Station to make unqualified recommendations concerning the use of growth regulator materials on Evergreen blackberries."

However, the low cost of the chemicals justifies the use of the growth regulator sprays. Growers who have not used the chemicals can try them out on part of their field. Most growers are willing to spend $2 per acre per application for a spray that may increase yields as much as 10%, Mr. Rasmussen said.

Trade Winds From California

ARCATA, CAL.—A new wholesale nursery has been incorporated in this north coastal California town under the name of Dows Prairie Flower Pot, at 1655 Grange Rd. Faye L. Martz and Ruth M. McNeil are owners of the establishment.

●

RICHMOND, CAL. — The California Spray-Chemical Corp. has announced plans to construct a new maintenance shop adjoining the main plant at Lucas St. and Ortho Way, Richmond. Estimated cost of the proposed addition is $65,000.

●

SEBASTOPOL, CAL. — Ranch-O-Rey Gardens has been incorporated in Sebastopol as a wholesale nursery, located at 9689 Occidental Rd. Don R. and Mollie A. King are principal owners.

●

OROVILLE, CAL. — The Garden Drive Nursery has been opened at 555 Oroville-Chico Rd., Oroville, by Louis and Mildred C. DeCosta.

●

FRESNO, CAL.—The Valley Nitrogen Products Co. is making plans to erect a laboratory at 12688 South Colorado St., Fresno, at an estimated cost of $32,800.

●

DAVIS, CAL. — Agrichem Industries, Inc., is reported as incorporating a branch in Davis, capitalized at $75,000. Richard B. Davis and John L. Moyer are listed as principals in the firm.

●

FRESNO, CAL.—Don A. Hill is operating a nursery under the name of Don Hill Nursery, retailing various kinds of agricultural chemicals, at 2707 West Olive St., Fresno.

●

SAN JOSE, CAL.—Joseph Ruick has opened a garden and farm supply store at 2245 South First St., San Jose.

●

OILDALE, CAL.—Little Hawaii is the name of a new garden and farm supply store opened in Oildale at 803 North Chester St., by Ruth E. Rothgeb and Dee Lee Stoops.

●

HAYWARD, CAL. — The Cherry Way Nursery is the name given to a new establishment located at 850 Cherry Way in Hayward. Leland H. DeQuadros is owner of the store, retailing various types of chemicals.

●

PORTOLA VALLEY, CAL. — Alwyn Bertschinger is now operating Al's Nursery at 900 Portola Rd. in Portola Valley, a new retail operation.

●

SUNNYVALE, CAL. — The Corral Bros., retailer of garden and nursery products at 108 S. Bayview Ave., Sunnyvale, is giving up that end of the business to concentrate on feed and fuel products.

●

MARTINEZ, CAL. — Fran MacAlvey and Bill Shelly are partners in the new MacAlvey's Ranch Nursery now open on Pleasant Hill Road, in Martinez.

●

HOOPA, CAL.—Gordon E. Corey had opened Corey's Nursery to retail various farm and garden supplies, on Marshall Lane in rural Hoopa.

Problems of Aerial Operators Outlined

SAN FRANCISCO—The case for understanding the trials of the aircraft pest control operator were outlined by Wanda Branstetter, executive secretary of the Agricultural Aircraft Assn., Inc., Fresno, before members of the Entomological Club of Southern California at a meeting in Alhambra recently.

Mrs. Branstetter said that aircraft operators, despite the strain and risks which they are constantly taking in the never ending war against the agricultural pest, are not fully appreciated and subjected to much malignment and ill-will.

The major problem, Mrs. Branstetter told the entomologists, is that the industry is dependent at present on a surplus market. Equipment, aircraft, are largely World War II surplus, and prices charged and wages paid are based on this surplus. But the end of the market is in sight and what will happen then, she asks.

Costs have risen substantially, she explained. In 1945 a Stearman plane cost the pilot $500. Now comparable aircraft replacement is $2,000 or $2,500. Insurance for pilots is very high—10% of the pilot payroll, because of the great risks involved.

Sleepy-eyed residents on the edges of planted fields are continually blaspheming pilots up before dawn to spray crops on which these very same residents may dine a few months later. Sometimes homeowners will take a shotgun to the aircraft, Mrs. Branstetter indicated, or will place the blame on the operator for dead turkeys or a poor egg crop later in the season.

The AAA also feels that "some control" be exercised over chemical salesmen, such as the licensing as is required of pilots. The association has several times met with the California State Department of Agriculture to promote the idea of licensing chemical salesmen, but "we have met with opposition from every side," Mrs. Branstetter said.

She said that her association has joined with the Western Agricultural Chemical Assn. recommendation for an educational program, that various groups should unit in "vigorous regional educational programs to acquaint pesticide salesmen, farmers, physicians, and others with the facts of modern pest control."

The first of such regional meetings is scheduled for next Sept. 10 at the fairgrounds in Fresno, she said. Some 400 to 600 are expected to attend that meeting.

"If an educational program could get this problem over to the farmer, then the solution would automatically fall into place," she said. "The fact needs to be driven home to the farmer that he should contact the extension service, a trained entomologist, the agricultural commissioner, or some one on that level of experience if he does not have complete confidence in his chemicals salesman."

Too frequently farmers do not understand that a 50% discount on the wrong chemical may cost them 200% more because the wrong material is applied at the wrong time, she said.

Thimet Test

PUEBLO, COLO.—Specially treated field corn seed will be test-planted in Pueblo County for red spider mite control. Arrangements for the tests were made by Gordon Mickle, extension entomologist from Colorado State University; Robert Seeberry of Boulder, representative of American Cyanamid Co., and M. V. Haines, Pueblo County agent. The seed was treated with Thimet. While not hurting either the ear or the stalk for livestock feed, the chemical may circulate sufficiently through the plant to repel the mites, Mr. Haines said.

POTATOES USE IT UP . . .

Survey of California Soils Shows Potassium Deficiency

BERKELEY, CAL.—Fertilizer experiments and a nutrient survey by four University of California researchers during the 1958 spring season showed that some fields in Kern and Tulare Counties are being depleted of exchangeable soil potassium to the point of deficiency, through frequent cropping to potatoes.

Potatoes as a crop are one of the heaviest known feeders on potassium. Nutrient removal studies in the Kern area showed that a 400-sack per acre crop of potatoes removed from the soil more than 250 lb. potash an acre.

K. B. Tyler, assistant olericulturist; O. A. Lorenz, professor of vegetable crops; P. M. Nelson, senior laboratory technician at University of California, Riverside; and J. C. Bishop, associate specialist, University of California, Shafter, participated in the studies.

With such large quantities of potassium being removed annually by the potato crop, available potassium in the soil is reduced considerably, unless weathering of the potassium minerals occurs at rates sufficient to replenish the supply.

To determine the extent of soil potassium depletion by frequent potato cropping, eight experiments were conducted by the University of California group in certain areas of Kern and Tulare Counties. The plots selected were where previously observed foliar symptoms and plant tissue analyses indicated that a response to potash fertilization might be realized. An additional 20 fields in Kern County were chosen at random for making a nutrient survey of White Rose potatoes.

Samples of soils from the experimental plots and survey fields were taken from the plow layer prior to planting and fertilizing. Soil samples were collected also from adjacent areas which had not been cropped.

Comparisons of the exchangeable potassium content of the cropped and uncropped soils indicate that as a result of cropping the potassium available to plants has decreased in some soils to levels as low as one fourth that in the adjacent uncropped soils. Although these potassium differences between cropped and uncropped soils were appreciable in most of the 20 survey fields, they were generally of less magnitude than the differences in the eight experimental fields which were known to be deficient in potassium.

The 1958 studies by the four researchers and previous experiments demonstrated that when exchangeable soil potassium is below 100 parts per million, it is in the deficiency range for potatoes. In these studies exchangeable soil potassium was determined by leaching 50 grams of soil with 500 milliliters of neutral, normal ammonium acetate and analyzing the leachate for potassium. In three of the eight field experiments, potassium was deficient and in the other five fields it was bordering on deficiency.

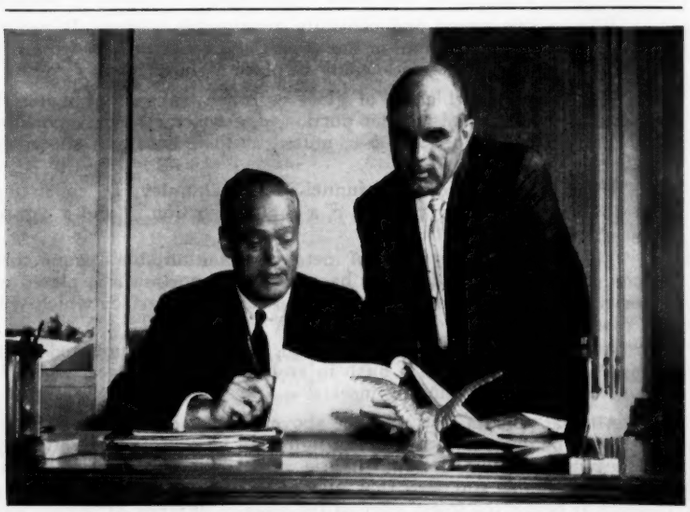
Plant tissue analyses of petiole samples from the same fields verified the fact that potassium was deficient in the three fields and low in the remaining five. The studies revealed that yield responses to potassium fertilization were observed in all eight fields with the greatest response in fields where exchangeable soil potassium was lowest.

Some of the older fields of the 20 in the University of California survey were on the borderline of potassium deficiency for potatoes as indicated by plant and soil analyses. In two fields which were more recently brought under cultivation and where steer manure had been applied before planting, the exchangeable soil potassium was in excess of 300 ppm in the cropped soil and over 400 ppm in the uncropped. These were the only soils of the entire study where potash application failed to bring about a marked increase in the foliar potassium content of the potato plants. Even in soils which were considered to have adequate levels of exchangeable potassium—above 150 ppm—potash fertilization resulted in higher levels of potassium in the petioles.

The professors report that in all fields considered there was good agreement between the amount of exchangeable potassium in the soil and the amount of potassium absorbed by the plants grown on these soils. Where potassium in the plant samples fell below 4%, exchangeable soil potassium generally was less than 100 ppm. Conversely, where potassium in the plant was above 8% at 110 days, exchangeable soil potassium was observed to be in the sufficiency range or above 150 ppm.

In these investigations it was noted that soil reaction has been considerably reduced over the years through continuous use of acidifying fertilizers such as ammonium sulfate and through the addition of sulfur for potato scab control. In three of the eight soils, for example, the pH — relative alkalinity-acidity — had been reduced by as much as two full units. Liming of two soils where the pH values were acid-below pH5 —resulted in increased potato yields and in more vigorous and healthy appearing potato plants.

These studies have shown that frequent cropping to potatoes has been an important factor in depleting the exchangeable potassium of the soils, and potassium fertilization is becoming increasingly necessary to maintain high potato yields.



CHARLES H. SOMMER (left) was elected to the newly created position of executive vice president of Monsanto Chemical Co. and Robert M. Morris (right) was elected a company vice president and appointed general manager of the organic chemicals division, the position which Mr. Sommer had held.

COTTON INSECT COURSE

STONEVILLE, MISS. — A study course on cotton insects and their control will be taught at the Delta Branch Experiment Station this summer for county agents, vocational teachers and others interested in the course. Life history studies of both harmful and beneficial insects will be given, insecticides and their application will be studied and methods of determining insects' presence, damage and needs for control will be included in the course.

Promotions Announced by California Spray-Chemical

RICHMOND, CAL. — Two promotions within its organization have been announced by California Spray-Chemical Corp. Raymond B. O'Connell has been made manager of the Thermal branch office and Leland A. Pressler has been made buyer for the company. Mr. Pressler will be located at the home office in Richmond.

Mr. O'Connell was formerly a sales representative at the Whittier office and has been with Calspray for three years. He is a native of Farmington, Mass., and attended the University of Massachusetts.

Mr. Pressler, previously a purchasing clerk, has been with Calspray 2½ years. He holds a degree in business administration from the University of California and is a native of Oakland, Cal.

LARGER NUT CROPS

PORTLAND, ORE. — Larger Oregon filbert and walnut crops than one year ago are now in prospect, according to the Oregon U.S. Department of Agriculture Crop Reporting Service.

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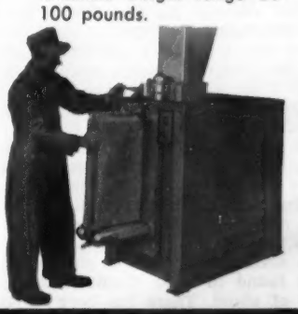

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INSECT, PLANT DISEASE NOTES

Cutworms Pose Problem In Iowa Counties

AMES, IOWA — Infestations of black cutworms are heavy in Grundy, Story, Jasper, Mahaska and counties to the east. Moderately heavy infestations were seen in Mills and reported from Union, Fremont and Page counties.

Controlling cutworms at this time is difficult. There are three main problems:

1. The cutworms are nearly full-grown and are hard to kill with any insecticide applied now.

2. Because of dry surface soil, the cutworms are staying 1½ to 2 in. deep, hard to reach with any insecticide.

3. At least some of the cutworms are inside the stalk where even high volume sprays can't get to them.

No new egg masses of European corn borer have been found since June 17 and there is little leaf feeding even on tall corn. All of the moths in central Iowa are emerged.

Other insects reported in Iowa include grasshoppers and Hessian fly. Grasshoppers were found in normal populations in southwestern Iowa, and eggs in alfalfa, red clover and other hayfields will hatch soon after the hay is removed.

Hessian flies have done heavy damage to wheat in southwestern Iowa. One field suffered a 50% loss. Farmers paid too little attention to control methods recommended earlier in the season.—Harold Gunderson.

Tennessee Weather Favors Several Cotton Diseases

KNOXVILLE, TENN.—Cool nights continue to retard cotton growth. Early season insect damage is about over but infestations continue to slow down growth in poorly drained fields, or the fields having cooler natured soils. Good cotton growing weather is needed rather than insect controls in most cases. Weather conditions have been favorable for several cotton diseases this season and in some cases is causing severe loss to stands. The two main diseases are believed to be Root Rot (Phymatotrichum omnivorum) and Rhizoctonia (Rhizoctonia solani).

Twenty-six fields were surveyed for boll weevils in McNairy County the week of June 22. Only two fields were found to be infested and the average for the fields found to be infested was 50 weevils per acre. Square counts can be made in some fields by June 29 and we should be able to get a clearer picture of just what the weevil situation is then.

Flea beetles and thrips have caused severe damage so far this season but the damage is tapering off. Controls would not help matters much at this late date unless some other insects are causing damage.

Common stalk borers are causing considerable damage along the margins of fields. The larvae are very small. The only known control is to mow weeds along field margins. Mowing should start in the fall. Mowing now will only drive the worms into the fields.

A severe infestation of root aphid was found in Dyer County causing loss of stand. There has been some spotted damage all over the cotton growing area.

Spider mites are being found along the edges of fields that have had infestations before in years past. This pest should definitely be watched to prevent damage like we had last year.

All sizes of yellow striped armyworms are being found in cotton. Infestations are not heavy but most fields are infested. Damage is only very light at the present.—R. P. Mullett.

Colorado Reports More Alfalfa Weevils in Field

FORT COLLINS, COLO. — The Colorado Insect Detection Committee reports that the alfalfa weevil build-up in untreated fields is continuing. Larimer County has recorded highest numbers at 2,000 per 100 sweeps. The weevil is also present in both Morgan and Montrose counties, but in relatively low numbers.

Also building up is the pea aphid population in Larimer County alfalfa fields, with 2,500 per 100 sweeps recorded. The infestations appear relatively high also in Morgan County at 1,000 per 100 sweeps, but low in Mesa County.

The committee noted, however, that the spotted alfalfa aphid has not been found in the Fruita, Loma, Mack and Clifton areas of Mesa County. Usually this insect by this time has appeared there.

In both Larimer and Morgan counties, some build-up of lygus bug populations has been noted in alfalfa fields.

On Mesa County peach orchards, lygus bug populations are low. This points to the possibility that there will be less damage to peaches this year.

The green peach aphid has completed its migration to summer host plants in Mesa County. Damage to peach trees is rated moderate to heavy. The committee also noted that the black cherry aphid has been a problem in some Delta County orchards. Control measures have been only poor to fair.

Wisconsin Farmers Warned Of New Aphid-Like Pest

OCONTO, WIS. — A bug new to Wisconsin has hit grain fields in the central and western parts of the state, according to Hallie Newlun, Oconto County agricultural agent. He feels it may get into Northeastern Wisconsin, so is putting out a warning to farmers to be on the lookout for the pest.

Some grain fields in the areas where insect has appeared are so infested that spraying will do no good, Mr. Newlun said. The green, soft-bodied, slow moving bug is 1/16 of an inch long. It resembles the English grain aphid.

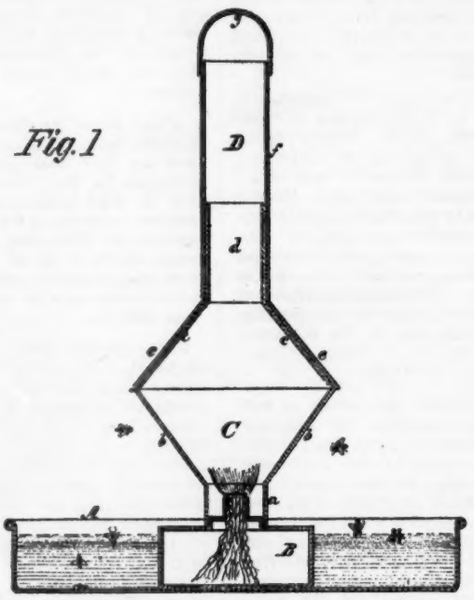
He pointed out that the aphids present now, in the areas where it has been found, are all females. The adults, some winged but most not winged, give birth to living young at the rate of about five a day on warmer days. "A few aphids are on both sides of the leaves and at leaf axils," he continued. "Strong winds and heavy rains may temporarily reduce their numbers. They cause plants to yellow and then brown. Red spotting and streaks may also occur. Small spots of damage in fields spread gradually."

Chinch Bugs, Thrips Worry Missouri Farmers

COLUMBIA, MO. — With grain harvest getting under way, this is the time to be on the watch for chinch bugs. In some sections where the soil is extremely dry and loose, the young, red chinch bugs are feeding on the roots of corn and grain sorghums. The bugs are usually just below the ground line, but this makes them much harder to control.

We are finding some soybean fields

Saga of Insect Pest Control



OIL-BURNING lamps appear to be the No. 1 means of attracting and killing insect pests a half-century or more ago, before the day of modern chemical pesticides and attractants.

Back in 1870, two inventors, Thomas Byrne, New York, and Diedrich Strunk of Texas, figured out and patented an "improvement in insect-destroyers" which became U.S. patent No. 109,869. The inventors described their masterpiece as follows:

"The nature of this invention consists in certain improvements in that class of devices known as insect destroyers, which will be hereafter fully described.

"The object of these devices is to destroy winged insects which are destructive to the cotton plants and other vegetation, by combining a lamp and reflector with a vessel containing some suitable liquid, in such manner that at night the light will be reflected into the liquid, thereby operating to decoy as well as to destroy insects which may be in the neighborhood, as will be hereinafter explained.

"To enable others skilled in the art to understand our invention, we will describe its construction and operation.

"In the accompanying drawing—

"A represents an open vessel, which is adapted for containing carbolic acid, coal-tar, or any other liquid which will destroy insects.

"Within this vessel and centrally arranged is a lamp, B, which is secured fast to the bottom of the vessel, and constructed with a rim on its top for receiving and keeping in place a chimney, C.

"The chimney, which is of glass or other transparent material, consists of a contracted tubular portion, *d*, a contracted base portion, *a*, and two conical portions, *b c*, united at their bases, as shown in fig. 1.

"Upon this chimney is a funnel-shaped chimney, D, consisting of a downwardly-flaring portion, *e*, a tubular portion, *f*, and a cap or hood, *g*.

"This chimney D is made of metal or other suitable opaque substance, and the inner side of its base or flaring portion *e* is plated or otherwise polished so as to afford a good reflecting surface which will not readily tarnish.

"At night, after the lamp is lighted, the device is mounted upon a post or suspended from a bush in any conspicuous place, where it will be visible to surrounding insects.

"All that portion of the device above the lower edge of the chimney D will be dark, and the rays of light will be reflected downwardly and outwardly into the liquid in the vessel A beneath, thus illuminating the liquid, and also that portion of the transparent chimney C which is below the lower edge of the opaque chimney D.

"This portion *b* of chimney C being illuminated, made of glass or other smooth substance and inclined, as shown in fig. 1, it operates to throw down into the liquid beneath the insects which fly against it."

where blister beetles are stripping the plants. Usually the injury shows up in isolated spots through the field, and large numbers of blister beetles will be found feeding in these areas.

During the week severe thrips injury became evident on late planted or late germinating cotton over much of Pemiscot, southern half of Dunklin and extreme southern New Madrid counties. The older, vigorous growing fields of cotton do not show this injury.

The thrips which are causing this injury are found concentrated in the terminals of the plants. Adult thrips are about 1/16 of an inch in length, very narrow, light tan to black in color and have 4 feather-like wings.

It is apparent that a heavy migration of thrips from small grains to cotton occurred about the time combining began. The migration has now stopped, and the thrips counts were beginning to decline in most fields by end of the week of June 20. With good growing weather, the plants will overcome this injury in about two to three weeks. In the more heavily infested fields of late cotton, spraying should help these damaged plants to overcome the temporary setback.

Spider mites continue to appear along the margins of more and more fields throughout the cotton growing area. In addition, these mites are being spread into and through the fields by cultivation, chopping and geese.

Marginal or spot spraying at this time will go a long way in reducing these populations, and slowing down their spread. This will reduce the over-all cost of mite control.

Barley and Oats Hit by Diseases in Kansas

MANHATTAN, KANSAS—Kansas farmers have suffered greater losses from red leaf of oats and yellow dwarf of barley this year than in any season since Kansas State University scientists noticed reduced yields in those crops from this disease.

Scientists discovered in 1952-53 that both barley yellow dwarf and oats red leaf were virus diseases. In 1954-55 they proved that they were the same disease. Since then they have found that at least six aphids common in Kansas spread the virus.

Losses from the disease probably will be 25 to 50% and sometimes higher this year, Webster H. Sill, Jr., said.

Farmers whose oat fields had pink (almost red) leaves that died rapidly and turned brown, and those who had spring barley with bright yellow leaves and somewhat stunted plants likely will be getting surprisingly small yields this year.

Mr. Sill said the disease has been widespread in all sections of the state that produce spring barley and spring oats, although spring barley in the northwestern counties generally has had only a small percentage of diseased plants. No Kansas barley variety is known to resist the disease as yet, but three varieties of oats have been noticeably better than all others.

Mr. Sill said future losses from the disease cannot be predicted accurately for red leaf of oats and yellow dwarf of barley, as losses can be predicted for streak mosaic of wheat, but county agricultural agents are being asked to survey eastern Kansas counties and estimate losses this summer. The University also has plots from which relative damage to different varieties and at different seeding times will be recorded this summer.

The disease has not been severe in winter barley as yet in Kansas although some winter barley varieties are susceptible to it.

A research program to combat the disease is under way at Kansas State University. Plant breeders and plant pathologists will work together to develop resistant varieties and entomologists will continue experiments with insecticides to control the aphids.

Young Grasshoppers in California Cause Alarm

SACRAMENTO, CAL. — Agricultural commissioners throughout northern California report young grasshoppers are hatching, but State Department of Agriculture entomologists indicate it is too early to evaluate their threat to crops.

A survey of egg laying adults last fall indicated a possibly heavy infestation this season. In previous dry winters similar to the one just experienced, a large and aggressive hatch emerged. As a result, most officials believe this will be a problem year.

Leafhoppers, however, are few in numbers this year and their depredations upon tomatoes, sugar beets and melons are expected to be limited.

Robert W. Harper, chief of the Bureau of Entomology, State Department of Agriculture, believes this is due to the effectiveness of spring and winter spray control.

Grasshoppers and Cutworms Feature Kansas Report

MANHATTAN, KANSAS — Grasshopper counts in Riley County last week were as high as 15 per square yard. They ranged in development from first to fifth instar. High counts of grasshoppers have been found in North Central and Northwestern Kansas counties. Severe damage to gardens, alfalfa, corn and small trees can be expected. Winged grasshoppers will move from hatching areas soon so control measures should be applied now.

Reports of cutworms damaging corn stalks at the ground level have been received throughout Northeast Kansas. The damage also occurs in fields having had insecticide treatment for corn rootworms.

The heaviest chinch bug counts seen this spring have been in North Central Kansas. Counts as high as 300 per linear foot of row have been recorded. Most fields of sorghum are infested only along the margins so border sprays can control the infestation.

All fields of corn, 30 inches or more extended height, in Republic County were infested with corn borers. Some moths were still laying eggs, but oviposition nearing completion and egg masses are smaller than normal. Most of the larvae are early instars feeding in the whorls at present. Infestation ranged from 5% to 90% of plants infested. Most fields averaged from 20% to 61% of plants infested. An average of 30% of the corn plants in Johnson, Douglas and Jefferson counties show

(Turn to INSECT NOTES, page 20)

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BRUSH CONTROL—Stull's Chemicals, Inc., San Antonio, Texas, utilized the helicopter for the aerial application of chemicals for brush control throughout the Southwest. Ranchers and farmers have found that the results of this brush control program have provided increased abundance of grasses and bring about a better range and pasture improvement, according to the firm.

Applying Chemicals by Helicopter for Brush Control Proves Success in Texas

SAN ANTONIO—The aerial chemical application for pasture improvement through brush control has proven to be a favorable and economic program, according to E. B. Stull, president of Stull's Chemicals, Inc., San Antonio.

Mr. Stull said that in a recent report compiled by Dr. C. L. Shrewsbury, associate director of research of Southwest Agricultural Institute, results obtained are indicative of the effectiveness of this method of control for pasture improvement.

Chemical was applied to experimental brush test plots established on Southwest Research Center grounds. The aerial chemical application was made from a helicopter traveling at "just above" the brush top level.

Data compiled from these test brush plots revealed that where two applications of chemicals were made nearly all brush was controlled to the degree which brought about substantial grass improvement. An estimated kill of 90% of the top growth was obtained on white brush which was the predominant species in these test plots, according to Dr. Shrewsbury. Continued evaluations are being made to determine root kill.

Stull's Chemicals, Inc., supported in part the experimental program set up by the Southwest Agricultural Institute in 1957 at the Southwest Research Center.

Fred Powell Named New President of California Chemical

SAN FRANCISCO — Appointment of Fred Powell to head up Standard Oil Company of California's sales and manufacturing activities in the chemicals field, has been announced by G. L. Parkhurst, Standard vice president and director.

Mr. Powell becomes president of California Chemical Co., Standard subsidiary which coordinates the parent company's chemical operations, with W. H. Shiffler named vice president. Mr. Parkhurst continues as chairman of the board of California Chemical, in addition to his other assignments with Standard.

In his new full-time position, Mr. Powell will coordinate the activities of Standard's two chemical subsidiaries, Oronite Chemical Co., functioning in the industrial chemicals field; and California Spray-Chemical Corp., which manufactures and sells agricultural chemicals.

T. G. Hughes and A. W. Mohr continue as the presidents of Oronite and Calspray, respectively, and as vice presidents of California Chemical.

Mr. Powell, previously vice president, Standard Oil Company of California, Western Operations, Inc., has been in charge of the company's refining operations in the West and has extensive experience in research and chemical work as well.

Mr. Shiffler has been a vice president of California Research Corp., research arm of Standard. His new assignment will include responsibility for development matters.

Highway Equipment Co. Names New Distributor

CEDAR RAPIDS, IOWA — Power Brake & Equipment, Inc., St. Paul, Minn., is a new distributor for Highway Equipment Co. of Cedar Rapids. It will handle New Leader lime spreaders, combination lime and fertilizer spreaders, widespread lime and fertilizer spreaders, and mobile blenders.

Agrico Announces Plant Superintendent Changes

NEW YORK—A. F. Vetter, former production superintendent at Agrico's Washington C. H., Ohio, plant, has been named division maintenance superintendent for the company's northeastern division, announced D. S. Parham, vice president in charge of production for the American Agricultural Chemical Co.

Replacing Mr. Vetter at Washington C. H. is A. W. Powell, formerly located at Alexandria, Va.

J. F. Watkins, formerly assistant superintendent at Agrico's Fulton, Ill., plant, becomes superintendent at Alexandria.

DUSTER KILLED

INDIANOLA, MISS.—Rupert Million Lyon, 33 year old planter and realtor, died recently when his plane crashed and exploded near here. He had recently purchased several planes and had gone into the crop dusting business. He had just taken off alone in a new plane and was turning with the wind when he lost speed. Witnesses said the plane nose-dived to the ground, exploded and burned.

Dormancy in Grapes Prolonged in Tests With Gibberellic Acid

DAVIS, CAL.—Gibberellic acid will make some grape buds stay dormant longer than usual, and may thereby offer a means of protecting shoots against early frost, according to Robert J. Weaver, University of California viticulturist, who reports the chemical held back bud growth on Zinfandel and Tokay vines in tests at Davis.

"Gibberellic acid is known to shorten the dormancy of some plants—potatoes and peaches, for example—and we wanted to check for a similar effect in grapes," Mr. Weaver says. "If the dormant buds could be made to grow in the autumn, the following year's crop could be predicted.

"We found just the opposite effect. Zinfandel vines were sprayed in September, 1957, with gibberellin at 1, 10, 50 and 250 parts per million. By April, 1958, untreated vines had up to 18 shoots, about 3 inches long. The gibberellin-treated vines had only 14 shoots at 10 ppm, 3 shoots at 50 ppm, and 1 shoot at 250 ppm, and these shoots were only about half as long as those of the control vines."

Similar results with Tokay vines indicated that dormancy was prolonged by the gibberellin treatment. Mr. Weaver says.

In a greenhouse experiment in December, 1957, Mr. Weaver placed 16-inch cuttings of Tokay vines in 3-inch-deep solutions of gibberellic acid at concentrations of .01 to 100 ppm.

"With one exception, no buds began growth by Feb. 20, 1958, on cuttings placed in the gibberellin solutions," he says, "while 17 of 30 untreated cuttings had produced buds by that date."

Prolonging dormancy is an unlooked-for effect of gibberellin that may prove useful to vineyardists in parts of the world where spring frosts often kill new shoots, Mr. Weaver explains.

Dylox Registered with USDA for National Use

NEW YORK—Dylox 50% soluble powder, a product of Chemagro Corp., has been registered by the U.S. Department of Agriculture for use nationally on alfalfa, cabbage and sugar beets for the control of a variety of injurious insects.

Alfalfa pests controlled by Dylox include alfalfa caterpillar, alfalfa webworms, beet armyworm, Lygus bugs, stink bugs, variegated cutworm, and western yellow striped armyworm. On cabbage, Dylox controls the imported cabbage worm, cabbage looper and diamond-back moth. On sugar beets, it controls alfalfa webworm, beet armyworm, beet webworm, dipterous leaf miners and cabbage looper. The application rate of Dylox per acre varies from ¾ lb. to 3 lb., depending upon the crop and pest involved.

FDA Establishes New Position as Assistant To Commissioner

WASHINGTON—The Food & Drug Administration has announced the establishment of a new position of assistant to the commissioner for regulations making. J. Kenneth Kirk, presently head of FDA's Boston district, will be transferred to the new Washington post, FDA said.

George P. Larrick, FDA commissioner, said that the new position has become necessary because of the increasing volume and complexity of regulations required in the administration of the Federal Food, Drug and Cosmetic Act. Subjects covered include food standards, safe tolerances for pesticides and food additives, safety clearance of new drugs, and certification of insulin, antibiotics, and coal-tar colors, as well as interpretive regulations under the general provisions of the law.

Mr. Kirk will advise the commissioner and the deputy commissioner and will act for them in discussions with industry and consumer representatives on proposed regulations. He will also coordinate the regulation making activities of FDA's scientific divisions, Mr. Larrick said.

Mr. Kirk entered the Federal service as a food and drug inspector at FDA's New York district in 1930. After tours of duty at New York, Buffalo and Pittsburgh, he became chief inspector of the Philadelphia district of FDA in 1937. In 1940 he joined the staff of the commissioner in Washington where he handled enforcement recommendations until his Boston appointment in 1957.

Grasshoppers Expected In Northern Arkansas

HARRISON, ARK.—John Shelton, Boone County agent, reports that the number of grasshoppers on farms in this area of North Arkansas is increasing rapidly. He said, however, that he doesn't look for a serious infestation of hoppers — unless the weather turns dry. "If we should have a few weeks of dry weather, we can look for trouble," he said.

The county agent said he has urged farmers to watch their pastures and crops closely in an attempt to prevent a serious outbreak of hoppers. He noted that it has been almost 10 years since serious infestations of hoppers have occurred in this region.

CLEARS UP YELLOWING

WOOSTER, OHIO — Sulfuric acid clears up a yellowing of the leaves in pin oat, according to two scientists at the Ohio Agricultural Experiment station, John Hacskaylo and Paul Struthers. The chlorosis of the foliage occurs when soil is too "sweet." In this case the trees starve for iron. Adding the sulfuric acid sours the soil around the trees and quickly changes the leaves from a yellow cast to a normal green.

THEN AND NOW of phosphate mining are shown in these two pictures being utilized by International Minerals & Chemical Corp. as part of its 50th anniversary observance. The picture at left was taken in 1909 and shows a typical phosphate mining operation. Industry production in 1909 was 2.33 million tons compared with 14.5 million tons in 1958. The right photo shows the modern dragline of today that scoops up a carload of ore at a time.

R. H. McGough

J. G. Baldwin

W. R. Van Liere

W. M. Bybee

Collier Announces Staff Reassignments

LOS ANGELES—Reassignment of three members of its marketing department has been announced by Collier Carbon and Chemical Corp., manufacturer of Brea Brand fertilizers.

R. H. McGough has been appointed manager of chemical sales development, which includes the company's industrial as well as agricultural chemicals. Formerly, Mr. McGough was manager of agricultural chemical sales development.

J. G. Baldwin has been appointed manager of chemical sales, encompassing both industrial and agricultural chemicals. William R. Van Liere has been appointed manager of agricultural chemical sales. Formerly, Mr. Baldwin was manager of agricultural chemical sales and Mr. Van Liere was staff assistant in agricultural sales development.

Appointment of Walter M. Bybee as southern area agriculturist was also announced by Collier. Mr. Bybee will be headquartered in Santa Ana, Cal., at Collier's area office for agricultural marketing activities in Southern California and Arizona.

New Hampshire Sets Plant Food Values

CONCORD, N.H. — Official values for plant food which will be applied this year have been established by Perley I. Fitts, commissioner, with the advice and consent of the Agricultural Advisory Board.

New Hampshire law, as revised a few years ago, specifies that violators of stated formulas, beyond the set tolerances allowed, shall be assessed penalties triple the value of the formula items found missing in official laboratory tests. The penalty money goes to the involved farmer, except penalty money for less than one-ton lots, which accrues to the state treasury.

Each year the agriculture commissioner and his advisors make a thorough canvass of the commercial fertilizer interests to establish per pound values for plant food.

Values established this year are: For nitrogen $3 per unit or 15¢ per pound; for phosphoric acid $2 per unit or 10¢ per pound; for potash $1.20 a unit or 6¢ per pound, and for magnesium oxide $1.25 per unit or 6¢ per pound. The tolerance for the magnesium is ½%.

CITRUS PEST BOOKLET

BERKELEY, CAL. — Up-to-date recommendations for control of citrus pests have been published by the Citrus Experiment Station at the University of California, Riverside. The "1959 Spray Program for California Citrus Fruits" is available free from University farm advisors throughout the state and from agricultural extension service offices on University campuses.

Fast Kill, Lack of Residue Claimed for Calspray Pesticide

RICHMOND, CAL. — California Spray-Chemical Corp. has introduced a new phosphate insecticide, "Dibrom" for which it claims a wide range of insect control, fast killing action and no residue. The makers say that the new product is less hazardous than most phosphate chemicals, and has a broad safety margin as indicated in rat feeding tests.

The product has been registered on a no-residue basis for use on a number of crops, according to Calspray. The list includes:

Broccoli, cabbage, cauliflower, Brussel sprouts, kale—for control of cabbage looper, imported cabbage worm, diamond back caterpillar, aphids.

Lettuce, spinach, celery, chard, collards, endives, mustard greens—for control of looper caterpillars, aphids.

Beans (dry or field), lima beans and peas for processing—for control of alfalfa looper, aphids and red spider mites.

Potatoes—for control of Colorado potato beetle, flea beetle.

Alfalfa clover — for control of aphids, looper caterpillars, leafhoppers, lygus bugs.

Grapes—for control of leafhopper.

Sugar beets—for control of red spider mites, leafhoppers.

Strawberries — for control of red spider mites, aphids.

Turf, lawns—for control of clover mite, leafhopper.

Ornamentals (14 different varieties)—for control of aphids, leafhoppers, red spider mites, tent caterpillars, birch and holly leaf miners, willow leaf beetle.

Barns, poultry houses, kennels—for control of housefly, lesser housefly, gnats, mosquitoes.

In evaluating the usefulness of Dibrom, Calspray points out that its versatility, like that of DDT, simplifies pest control by enabling the farmer to use a single material for many different crops or for the many types of insects that may attack a single crop.

Dibrom is said to be compatible with most fungicides and insecticides, with the exception of highly alkaline materials such as lime, lime sulfur or Bordeaux mixture. Since the material kills by contact it is important to get maximum coverage. The insects must actually be contacted by Dibrom to obtain control.

According to Calspray, tests on other crops have been completed since registration was obtained for those listed above. On cotton, results are reported good for control of cabbage loopers, lygus, stinkbugs, armyworms and leaf perforator; on grapes for leaf roller, and on tomatoes and grapes for control of flies.

Minerals & Chemicals Wins Safety Award

McINTYRE, GA. — The National Safety Council announced recently that the Edgar Division of Minerals & Chemicals Corporation of America, located at McIntyre, has been presented the council's "Award of Honor" for its excellent safety record.

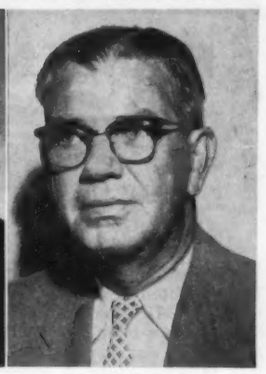
Howard Pyle, president of the National Safety Council, in a letter of congratulations to Earl K. Thompson, safety engineer of the Edgar Division, explained that the company qualified for the award because of its low injury rates over the four-year period from 1955-1959.

Kentucky Firms

FRANKFORT, KY. — Two firms have been incorporated in Kentucky to deal in fertilizer. They are the Griffin Fertilizer Co., Butler, and Estill County Farm & Home Supply, Irvine.

M. W. Mawhinney

Mack A. Glass



R. G. Fitzgerald

Smith-Douglass Names New Plant Managers

NORFOLK, VA.—M. W. Mawhinney has been appointed manager of the Streator, Ill., operation of the Smith-Douglass Co., J. H. Culpepper, vice president, has announced. Mack A. Glass has been named to succeed Mr. Mawhinney at Albert Lea, Minn. R. G. Fitzgerald, who was manager at Streator, has been named manager of contract sales for Smith-Douglass.

A graduate of Doane College, Mr. Mawhinney was born in Nebraska in 1912. He worked eight years as an agricultural economist with the U.S. Department of Agriculture before joining Smith-Douglass in 1945 as a sales representative at Cedar Rapids, Iowa. He was transferred to Albert Lea as manager in 1948, when Smith-Douglass built a plant there.

Mr. Glass was born in Canada in 1920. After graduation from the University of Illinois, he taught vocational agriculture before joining Smith-Douglass in 1947. Before being named assistant sales manager in 1954, and subsequent transfer to Smith-Douglass headquarters in Norfolk, Va., he was a sales representative in Iowa and Illinois. In 1957, he returned to the Midwest to supervise sales training for Smith-Douglass in its midwest and southwest territories.

California Cotton Growers Get 1,604,000 Bales from 732,000 Harvested Acres in '58

SACRAMENTO, CAL.—With production of 1,604,000 bales, California ranked second in the nation's cotton producing states in 1958, according to a report prepared by the California Crop and Livestock Reporting Service. The only state exceeding California's production last year was Texas.

Value of the 1958 cotton production in California was estimated at $271,098,000, compared with a figure of $258,400,000 in 1957.

Retaining its lead established in 1947, the state's cotton crop outranked all other crops produced in the state in terms of value.

Production of cottonseed in California was estimated at 626,000 tons in 1958, valued at $26,918,000. In 1957, the production was estimated at 613,000 tons, valued at $32,366,000.

The average 1958 yield of cotton per acre, 1,049 lb., set a new record high mark for average yield in California. California's average yield per acre was the highest in the nation in 1958.

Fresno County was the leading cotton producing county last year, with Kern County running a close second. In third place was Tulare, followed by Kings and Imperial.

The highest yield of cotton in the state was recorded in Imperial County, with 1,266 lb. an acre. The national average is 466 lb. an acre.

The service said that the 1958 California cotton crop had excellent growing conditions and almost ideal harvest weather. The crop was grown on the best land, mainly because of acreage restrictions and U.S. Soil Bank participation. The state's cotton crop was planted on 750,000 acres and 732,000 acres were harvested. In 1957, California planted 728,000 acres and 711,000 acres were harvested. The larger acreage planted in 1958 was brought about by less participation in the U.S. Soil Bank. The acreage removed to comply with allotments accounted for most of the unharvested acreage.

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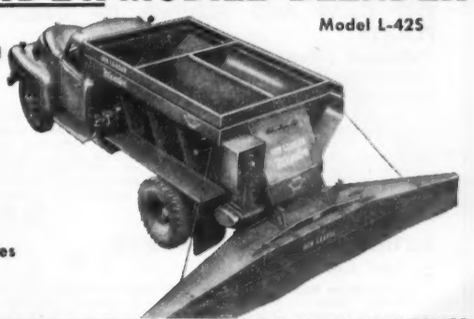

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PATENTS and TRADEMARKS

2,890,120

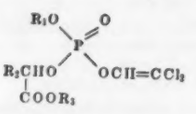
Inactivation of Enzymes in Plant Tissue. Patent issued June 9, 1959 to Rachel U. Makower, El Cerrito, Cal., assignor to the United States of America as represented by the Secretary of Agriculture. A process comprising treating raw edible plant material normally subject to enzymic deterioration with an aqueous solution of an acid selected from the group consisting of hydrochloric acid, sulphuric acid, and phosphoric acid, in a quantity sufficient to give the solution a pH not higher than 3 and in a concentration not to exceed about 1 normal, about 5 to 70% of a volatile oxygenated solvent selected from the group consisting of ethanol, propanol, isopropanol, acetone, and ether, and a trace of a wetting agent, said aqueous solution being free from any sulphiting agent, whereby to inactivate enzymes in the plant tissue.

2,890,934

Method for Manufacture of Phosphatic Material. Patent issued June 16, 1959, to Roger Bart, Lakeland, Fla., assignor to International Minerals & Chemical Corp., Skokie, Ill. A method of continuously precipitating dicalcium phosphate from acidic phosphorus-bearing solutions containing iron in solution as an impurity which comprises reacting said solution in a plurality of stages with calcium carbonate, adding from about 15% up to about 70% by weight of the stoichiometric amount of calcium carbonate required for dicalcium phosphate precipitation into the first reaction stage, allowing time for substantial, but incomplete reaction of the first added amount of calcium carbonate, discharging the partially reacted slurry mixture from the first reaction stage and adding to the partially reacted slurry mixture the balance of the calcium carbonate required for completion of the dicalcium phosphate precipitation reaction in a subsequent reaction stage prior to completion of the reaction with the first added quantity of calcium carbonate.

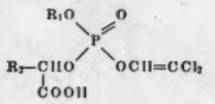
2,890,236

Phosphoric Acid Ester Insecticides. Patent issued June 9, 1959, to Richard Sehring and Karl Zeile, Ingelheim, Germany, assignors to C. H. Boehringer Sohn, Ingelheim, Germany. Phosphoric acid compounds having the structural formula

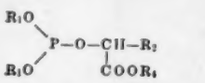


wherein R_1 is selected from the group consisting of methyl and ethyl, R_2 is selected from the group consisting of hydrogen, methyl and ethyl, and R_3 is selected from the group consisting of hydrogen and alkyl radicals with 1 to 8 carbon atoms.

The method of producing phosphoric acid compounds having the structural formula



wherein R_1 is selected from the group consisting of methyl and ethyl, and R_2 is selected from the group consisting of hydrogen, methyl and ethyl, which comprises subjecting a phosphite having the structural formula



wherein R_1 and R_2 have the meaning indicated above and R_4 is alkyl with 1 to 8 carbon atoms, to a condensation reaction with chloral at temperatures below 25° C., saponifying the reaction product with a tertiary amine, and neutralizing the saponification product with a strong mineral acid.

2,890,960

Method for Fruit Fly Control. Patent issued June 16, 1959, to Vladimir Dvorkovitz, Elmhurst, and Ivan C. Brooks, Bellwood, Ill., assignors to the Diversey Corp. The method of preventing oviposition by fruit flies on fruit and vegetables which comprises supplying on the unpeeled surface thereof an effective amount of an antienzyme oviposition inhibitor of the group consisting of dehydroacetic acid, 2-methyl-1,4-naphthoquinone, n-lauroyl sarcosinic acid, p-hydroxybenzoic acid and salts of said acids, and maintaining the antienzyme thereon during exposure to fruit flies.

Books on Fertilizers And Their Use

FUNDAMENTALS OF SOIL SCIENCE—Third Edition

By C. E. Millar, late Professor Emeritus of Soil Science; L. M. Turk, director; and H. D. Foth, associate professor of soil science, Michigan State University.

This text completely revises and brings up to date the second edition. Special attention is given to progress made in the basic principles of soil science since the publication of its predecessor. This edition includes more emphasis on soil texture and the concept of the texture profile, more discussion of the influence of the soil forming factors on soil development, and more facts about clay minerals to provide a clearer understanding of the differences in the behavior of soils. 496 pages, illustrated. 6x9¼"... **$7.75**

SOIL FERTILITY AND FERTILIZERS (1956)

Samuel L. Tisdale and Werner L. Nelson

An advanced college text, for juniors and seniors, following backgrounding course in soils. Covers elements required in plant nutrition, their role in plant growth, and the soil reactions to these nutrients. Several chapters on manufacture, properties and agronomic value of fertilizers and fertilizer materials. Latter part covers soil fertility evaluation and use of fertilizers in sound management program. 430 pages, cloth bound **$7.75**

PLANT REGULATORS IN AGRICULTURE

Dr. Harold B. Tukey

Published September, 1954. A text book giving background material for county agents, farmers, citrus growers, nurserymen, gardeners; providing fundamentals and general principles; covers encouragement of roots by plant regulators, control of flowering and fruit setting, parthenocarpy, abscission, prevention of preharvest fruit drop, delaying foliation and blossoming, maturing and ripening, inhibition of sprouting and weed control. Brings together specialized knowledge of 17 authorities in the field, with two chapters written by Dr. Tukey, head of department of horticulture at Michigan State College. 269 pages **$6.50**

THE CARE AND FEEDING OF GARDEN PLANTS

Published jointly by the American Society for Horticultural Science and the National Plant Food Institute.

An entirely new, one-of-a-kind book, it is designed to acquaint readers with nutritional deficiency symptoms or "hunger signs" of common yard and garden plants including lawn grasses, shrubs, flowers, garden vegetables, and cane and tree fruits. It stresses plant "feeding," or "what makes plants grow." Sixteen of the nation's leading horticultural authorities collaborated in its preparation. Cloth bound, 300 pages of text and illustrations including 37 pages in full color **$3.00**

AUXINS AND PLANT GROWTH

A. Carl Leopold

A 366-page book, complete with bibliography, appendix, and index, discusses the fundamental and applied aspects of growth hormone and synthetic auxin action in plants. These are of interest to all workers in agricultural chemicals—for weed control, flowering control, fruit set, flower or fruit drop and plant propagation. The text is divided into two sections, (1) fundamentals of auxin action, and (2) auxins in agriculture. These cover developmental effects of auxins, the physiological and anatomical effects of their application, the chemical nature of growth regulators, and methods of applying auxins and their persistance in plants and soils. Other subjects covered: rooting, parthenocarpy, flower and fruit thinning, control of pre-harvest fruit drop, flowering, dormancy and storage, herbicides, miscellaneous uses of auxins, and potentials of auxins and auxin research. Published by University of California Press..... **$5.00**

ECONOMIC AND TECHNICAL ANALYSIS OF FERTILIZER INNOVATIONS AND RESOURCE USE

By E. L. Baum, Earl Heady, John Pesek and Clifford Hildreth.

This book is the outgrowth of seminar sessions sponsored by TVA in 1956. Part I—Physical and Economic Aspects of Water Solubility in Fertilizers. Part II—Examination of Liquid Fertilizers and Related Marketing Problem. Part III— Methodological Procedures in the Study of Agronomic and Economic Efficiency in Rate of Application, Nutrient Ratios and Farm Use of Fertilizers. Part IV—Farm Planning Procedures for Optimum Resource Use. Part V—Agricultural Policy Implications of Technological Change. It presents new methodological techniques for more efficient handling of research problems related to fertilizers and provides more meaningful answers to problems of practical application **$4.50**

HUNGER SIGNS IN CROPS—Second Edition

A symposium—published jointly by the American Society of Agronomy and the National Plant Food Institute.

A comprehensive study of nutrient-deficiency symptoms in crops compiled by 19 of the leading authorities in the field. It is being widely used by college professors, research and extension specialists, industrial chemists and agronomists, county agents and teachers of vocational agriculture. Many farmers have found it of particular value in planning their fertilizer programs. Cloth bound, 390 pages, 242 illustrations, including 124 in full color **$4.50**

USING COMMERCIAL FERTILIZER (1952)

Malcolm H. McVickar

Dr. McVickar is chief agronomist of the National Fertilizer Assn. The book deals specifically with commercial fertilizer, how it is produced and how to use it. It is non-technical. It includes chapters on how to measure fertility of soils, secondary and trade-element plant foods. 208 pages, 106 illustrations, cloth bound..... **$3.50**

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Gilbeart H. Collings

Based upon the author's practical experience as an experiment station agronomist and teacher, and incorporating information on recent developments by agronomists, chemists, engineers and fertilizer manufacturers. Authoritative on problems concerning commercial fertilizers and their use in gaining larger yields. 160 illustrations, 522 pages **$8.50**

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M. H. McVickar, Ph.D.

Outlines clearly and concisely how to have productive pastures to furnish high-quality forage for livestock, economically and efficiently. Written for grassland farmers. Covers the important activities associated with establishment, management and efficient use of pastures as grazing lands or as a source of fine winter feed for livestock. It is as specific as possible for all U.S. pasture areas. Twenty chapters, 256 pages, illustrated **$3.00**

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Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of $25 must accompany each notice of opposition.

Camp, in heavy capital letters, for insecticides, rodenticides, bactericides, disinfectants, weed killer and deodorants. Filed Jan. 29, 1958, by Camp Chemical Co., Inc., Brooklyn, N.Y. First use March 1, 1947.

Espesene, in capital letters, for petroleum product used as a diluent in the production of household insecticides. Filed Sept. 5, 1958, by Eastern States Petroleum & Chemical Corp., Houston, Texas. First use July 16, 1958.

Fleacide, for veterinary preparation; a parasiticide for external application to animals for killing and/or repelling external parasites. Filed Sept. 25, 1958, by Curts Laboratories, Inc., Kansas City, Kansas. First use Oct. 2, 1936.

Vapex, in capital letters, for liquid insecticide. Filed Dec. 5, 1958 by West Chemical Products, Inc., Long Island, N.Y. First use Nov. 6, 1958.

Ollan, in capital letters, for insecticide. Filed Dec. 5, 1958, by Wilson & Toomer Fertilizer Co., Jacksonville, Fla. First use Nov. 18, 1958.

Trip, in capital letters, for insecticide and pesticide. Filed Dec. 5, 1958, by Wilson & Toomer Fertilizer Co., Jacksonville, Fla. First use Nov. 18, 1958.

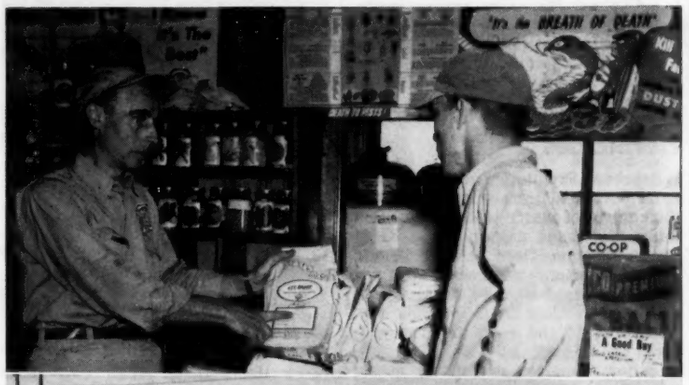
Trysben, in capital letters, for weed killing compounds. Filed Jan. 23, 1959, by E. I. duPont de Nemours & Co., Wilmington, Del. First use Jan. 13, 1959.

Hercules, in italic capital letters, for insect repellents and toxicants, urea, urea formaldehyde resins, ammonium nitrate and ammonium nitrate solutions. Also Hercules trade mark figure of mythical character for same products. Filed July 2, 1958, by Hercules Powder Co., Wilmington, Del. First use Jan. 1, 1922, on pine and terpene chemicals.

SPECIAL MERCHANDISING SECTION

BETTER SELLING

MARKETING NEWS AND FEATURES



REEDY'S FARM SUPPLY, Rocks, Md., is shown in these two photos. In the upper photo, store manager Harry L. Markley explains to a customer the mixture on a bag of pesticide. By this explanation, the store is certain the customer will be satisfied. In the lower photo, the spreader operator readies the tubes for spreading fertilizer on a field.

Highest in 37 Years . . .

Spreading Service Addition Raises Volume to 500 Tons

By PHIL LANCE
Croplife Special Writer

Since Roger Reedy of Reedy's Farm Supply, Rocks, Md., has been including spreading services with the sale of fertilizer, sales volume has reached an all time high of 500 tons for the first time in its 37 years of existence.

"And we don't lose any money through it," says Mr. Reedy. "We price our fertilizer on a bag basis, but handle it in bulk and thereby enjoy a $3 differential. And this $3 per ton covers the cost of spreading. If customers want to buy fertilizer in bulk and do their own spreading, they save this sum. But almost to a man, each customer depends upon us for the spreading and this cost is absorbed in the price."

Limestone has also enjoyed increased sales volume and over 2,000 tons are spread annually. A bulk silo with a 70 ton capacity stores the limestone which is brought there by two store-operated dump trucks. Prices are also based on bag quantities with bulk handling being responsible for the difference that pays for the spreading service.

Mr. Reedy uses newspaper advertising heavily to promote his fertilizer spreading service. Farmers making inquiry about this "free" service are explained the set-up and, because they have already been buying bagged fertilizer, they don't mind making a switch to Reedy's Farm Supply where they can take advantage of the free spreading service.

"Farmers in our area are small quantity buyers of fertilizer and have always been buying fertilizer in bags," explains Mr. Reedy. "The few that have been buying it in bulk have their own spreading equipment and these are not the customers we're aiming for. Most farms in our area are one or two man operated and they aren't looking for extra work just to save a few dollars. That's why they're so anxious to take advantage of our bagged price offer to get the spreading service free."

The major crops in this area are corn, pasture for livestock, alfalfa, hay and grains. Most popular formulations are 2-12-12; 0-14-14; 0-19-19 and 5-10-10.

The three-ton spreader truck is capable of spreading 21 tons daily and one employee is constantly retained on this job. This has helped farmers to become personally acquainted with him and they look upon him as a specialist. As a result, he can also double as a salesman.

The spreader operator constantly keeps handing out a supply of printed data and information concerning the types of fertilizer to use on various crops and other information that helps the farmer realize a greater return from his crops. He also takes time out to discuss the farmer's crop situation and offers his suggestions. Because he has been in contact with the crops on other farms, he can speak authoritatively and farmers look up to him as a specialist.

"This enables him to write up a farmer's advance order for fertilizer, pesticides and additional products," says Mr. Reedy. "He uses testimonials that we supply him from other

(Turn to REEDY'S, page 13)

$1,500 Monthly Advertising Budget Increases Sales for Texas Company

By JESS BLAIR
Croplife Special Correspondent

Selling fertilizer and insecticides has become a profitable feature at the Hurt Exterminating Co. of Odessa, Texas. After six years as a pest exterminator, Webb Hurt and his son Gene put in a chemical store, and within four years it was netting as much profit as the termite control business.

"We were handling chemicals, so we decided to sell them on a retail basis," said the elder Mr. Hurt. "Then we got a franchise on a popular fertilizer and started selling it both wholesale and retail."

Next in line were peat moss, small packaged pesticides, sprayers and small tools. These items tie-in with pest control, Mr. Hurt says, because a sale in one will bring business in other merchandise. Since putting in the big 40 by 75-ft. concrete tile building, sales have increased 400%.

Mr. Hurt attributes this to several things, but mostly to merchandising methods that could be copied successfully by many dealers in farm chemicals or supplies.

First, he believes in advertising to the extent that $1,000 to $1,500 is just an average month's budget. This is split three ways, by TV, newspaper and direct mail.

"TV is the best," he says, "but we insist on at least a minute and a half to two minutes for spots. We take a garden or field insect and then show its picture to the audience, identify it, tell its habits and what kind of chemical is required to kill it. These insects are rotated, so that each harmful insect in the area is described."

He also uses all the national advertising put out by manufacturers and shows many of these circulars on the program. In addition, he has seven retail dealers in each area, so he shows a picture of each one occasionally, gives the name, address and tells how the man can serve people in his area.

Direct mail is also used every day. Mr. Hurt buys a list of new residents who move to this city of 70,000. He gets the list from the Retail Merchants' Assn. He then sends each family a welcome letter and offers them a 5 lb. bag of rose food if someone will come to the store after it.

"This has had wonderful results," he said. "We often get a contract for termite control, and we sell our plant chemicals and supplies."

Newspaper advertising consists of two large display ads and one small one each week in the city's daily newspaper. These ads also give information on insects and soil problems and feature the store's products.

Inside the big beautiful store, Mr. Hurt has a unique collection of West Texas insects. These are in transparent bottles arranged neatly into slots on a circular panel board. Insects are labeled and given a short description.

"That display cost something," Mr.

(Turn to HURT, page 15)

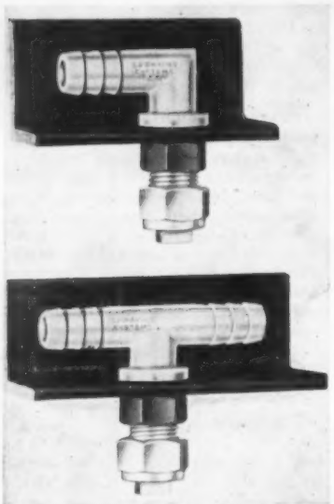
WEBB HURT (left), and his son Gene, are owners of the Hurt Exterminating Co., Odessa, Texas. Mrs. Lee Dell Copeland (center), is secretary and receptionist. The Hurts' flair for advertising can be seen in the figures drawn on the wall behind them. The drawings cover about 70% of the wall space.

WHAT'S NEW IN PRODUCTS · SERVICES · LITERATURE

To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

No. 6932—Nylon Spray Nozzles

A new type of Tee-Jet spray nozzle has been introduced by Spraying Systems Co. which permit the fabricating of a spray boom from an angle-iron instead of piping. The nozzles are mounted in holes drilled in an angle-iron at desired intervals



and the hose shanks are connected by hose to make up the complete boom. The nozzles are supplied with double and single hose shank bodies for inside and end positioning on the boom. The complete nozzle consists of hose shank, nozzle body, cap and strainer body made of nylon, with strainer screen in stainless steel and orifice tips in either aluminum or stainless steel. The assembly is held in position on the angle-iron with a lock nut. For details, check No. 6932 and mail.

No. 6933—Fruit Insecticide Folders

Two folders which describe use of Sevin insecticide on fruit are now available from Union Carbide Chemicals Co., division of Union Carbide Corp. One folder gives details about application of Sevin on apples, pears and peaches, and the other one covers grapes. Application rates and directions are included. Copies of the folders may be obtained by checking No. 6933 on the coupon and mailing to this publication.

No. 6931—Movie on Urea

"Greener Pastures," an educational movie which stresses the value of urea for supplemental nitrogen applications to increase agricultural yields and efficiency, has been announced by E. I. du Pont de Nemours & Co., Inc. Filmed mainly in the Mid-Atlantic and Midwest states, the 16 m.m. color, sound movie compares old farming methods with those of the modern farmer who employs scientific soil-testing and fertilization. Benefits of pasture-building to dairymen and cattlemen are also cited in illustrations of increased yields resulting from supplemental nitrogen applications. For information on obtaining a print of the film, check No. 6931 on the coupon and mail.

No. 6930—Granular Herbicides

Amchem Products, Inc., is offering two new 2,4-D granular herbicides for control of water weeds. Marketed under the trade names "Aqua-Kleer 10" and "Aqua-Kleer 20," the 10 and 20 formulations represent the per cent by weight of 2,4-D acid equivalent. Aqua-Kleer 20 is for bulk use. According to the company, the concept of this control is easier application, slow release of the active ingredient and coordination between the treatment and rapid root growth. Aqua-Kleer 10 comes in 5 lb. canisters and Aqua-Kleer 20 comes in 50-lb. bags. For details check No. 6930 on the coupon and mail.

No. 6934—Lightweight Pallets

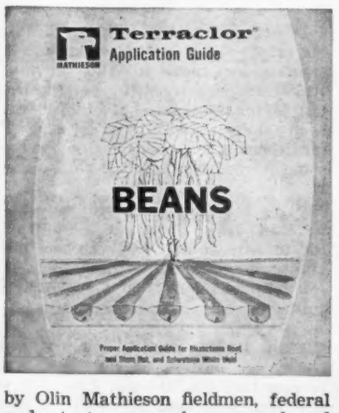
Lightweight "Sak-Pak" expendable pallets for use for loading chemicals, lime, fertilizer and other bagged products, have been introduced by Calco Supply Co. The firm has three sizes of pallets available. The pallets are made of corrugated paper reinforced with Kraft veneer board. Each can carry approximately 4,000 lb. and the pallets can be stacked three high. They weigh only 5 lb. each. For details about the product, check No. 6934 on the coupon and mail.

Also Available

The following items have appeared in previous issues of Croplife. They are reprinted to help keep dealers on the regional circulation plan informed of "What's New."

No. 6917—Bean Fungicide Guide

A Terraclor application guide for beans giving detailed information on the use of this soil fungicide is now being distributed by Olin Mathieson Chemical Corp. The illustrated 4-page guide's objective is to control root and stem rot and white mold. The guide tells how to get the most from Terraclor. It is a compilation of work



by Olin Mathieson fieldmen, federal and state research personnel and growers who have used Terraclor to control the disease. Additional information can be obtained by checking No. 6917 on the coupon and mailing.

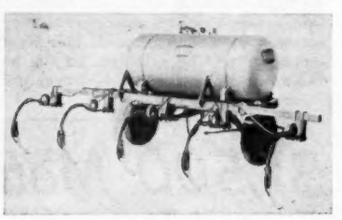
No. 6923—Insecticide Sprayer

A new mobile insecticide sprayer is available from West Chemical Products, Inc. The unit was developed for large or small areas where compressed air is unavailable for fogging. It has a spray head of five aerosol nozzles that dry fogs insecticides

three times faster than two-nozzle sprayers, the company said. The unit is designated the "Spacemaster." The unit produces a dry fog of insecticide particles in the aerosol range of 12 to 15 microns average diameter. With the proper insecticide, flying insects in 5,000 cu. ft. can be fogged in one minute, company literature stated. Range is from 40,000 to 50,000 cu. ft. from one position. Details are available by checking No. 6923 on the coupon and mailing.

No. 6918—Ammonia Applicator

John Blue Co., Inc., has introduced an ammonia applicator called the "Blue Nitro-Shooter" series "80." The machine has a tank capacity up to



310 gal., full 26 in. clearance, transport lock, alloy steel spindles, heavy duty Timken bearings, 12 ft. tierod free, 3 in. sq. tool bar and a short turning radius. It has a welded chassis. The machine comes with either 100, 150, 200, 250 or 310 gal. tanks. The metering device is a AND-Y pump or Nitrolator with speed and quantity control. The chassis has an 80 in. tread and over-all width of 96 in. The applicator comes with 1¼ or 1 in. alloy steel spring tine or high carbon rigid shank. The tool bar has an 8 ft. straight or 14 ft. folding length. For details, check No. 6918 on the coupon and mail.

No. 6928—Heptachlor Selling Course

Velsicol Chemical Corp. is distributing a "Heptachlor Salesman Insect Control Refresher Course." According to the company, the course is designed to educate dealers on the use of insecticides, but is appropriate for formulators and distributors' salesmen. Included in the course are a number of lessons, Heptachlor promotion materials and order form listing all available promotion pieces. Catalog sheet M-51 tells about the Heptachlor dealer "Sales-Builder" program. For details about the course, check No. 6928 on the coupon and mail to this publication.

No. 6921—Fertilizer Spreader

The John Blue Series "800" Chemi-Spredder has been added to the 1959 line of the John Blue Co., Inc. The unit can cover up to 20 acres an hour

Send me information on the items marked:

- ☐ No. 6917—Bean Fungicide Guide
- ☐ No. 6918—Ammonia Applicator
- ☐ No. 6920—Insecticide Report
- ☐ No. 6921—Fertilizer Spreader
- ☐ No. 6922—Spreader Accessory
- ☐ No. 6923—Insecticide Sprayer
- ☐ No. 6924—Hand Insecticide Applicator
- ☐ No. 6925—Air-Type Power Sprayer
- ☐ No. 6926—Fruit Spray Chart
- ☐ No. 6927—Orchard Fertilizer Applicator
- ☐ No. 6928—Heptachlor Selling Course
- ☐ No. 6929—Sprayer Spacing Attachment
- ☐ No. 6930—Granular Herbicides
- ☐ No. 6931—Movie on Urea
- ☐ No. 6932—Nylon Spray Nozzles
- ☐ No. 6933—Fruit Insecticide Folders
- ☐ No. 6934—Lightweight Pallets

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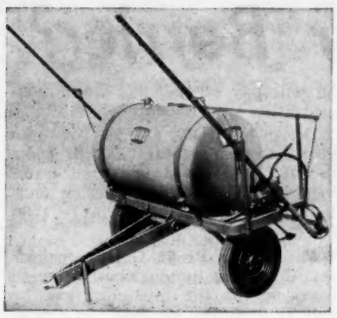


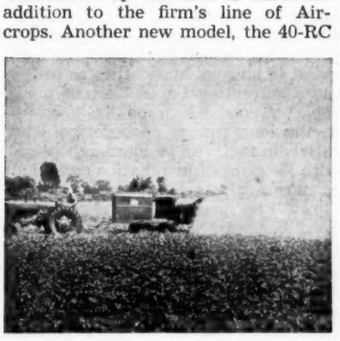
at rates in excess of 60 gal. an acre on a 28 ft. swath and more than 80 gal. an acre on the 21 ft. swath, company literature said. The unit's entire chassis is cold formed and welded. The boom is constructed of cold-finished steel and a wide choice of nozzles is available, both broadcast and dribble type. A tool bar for subsurface application is also available. The broadcast nozzles are of stainless steel with a 40 in. spacing and a special wide angle pattern. More details can be obtained by checking No. 6921 on the coupon and mailing.

No. 6927—Orchard Fertilizer Applicator

General Metals, Inc., has announced a new applicator designed especially for appying nitrogen solutions and complete liquid fertilizers to orchards. Trailer Applicator Model 450 consists of a trailer frame, special boom, heavy-duty tank saddles, 235 gal. aluminum or stainless steel tank, Dempster Metering Pump, front end jack and a special shield to stop limbs from getting caught in the applicator and doing damage to the trees. The frame is constructed of heavy 4 in. channel iron and is mounted on 15 in. automotive wheels. The trailer has a front end, top crank jack for positioning the trailer hitch. The pump is driven direct from the ground wheel of the trailer by roller chain. The pump's setting dial can be set at any of 14 positions and adjusted to intermediate positions to give low or high rates of application. Check No. 6927 and mail for details.

No. 6925—Air-type Power Sprayer

A swath up to 60 ft. wide can be covered with one trip across a field with the John Bean Model 30-RC Aircrop Sprayer, announced the John Bean Division of Food Machinery & Chemical Corp. The unit is the latest addition to the firm's line of Aircrops. Another new model, the 40-RC



Aircrop, a self-contained sprayer, will spray a swath up to 90 ft. wide. For more details, check No. 6925 on the coupon and mail to this publication.

No. 6920—Insecticide Report

A booklet entitled "The Special Values of Pyrethrum Insecticides" is being distributed by Charles Hurd Associates. The booklet contains a report by the Armed Forces Pest Control Board which has compiled worldwide research study results on pest control problems faced by military units. With permission, the document was reproduced in full in this booklet for the information of civilians who face the same problems in the U.S. The booklet is distributed as a public information service on behalf of the pyrethrum growers in British East Africa and the Belgian Congo, who grow the bulk of pyrethrum used in the U.S. Details of the product's effectiveness, toxicity, etc., are included. For copies, check No. 6920 on the coupon and mail.

No. 6926—Fruit Spray Chart

A chart which outlines recommended procedures for the control of a number of deciduous fruit tree insects and mite pests has been published by Stauffer Chemical Co. Major emphasis is on dosage recommendations of Trithion for delayed dormant, dormant and summer sprays and for post-harvest application to deciduous fruit. Crops include apples, crab apples, pears, cherries, plums, peaches and grapes. Copies of the chart can be obtained by checking No. 6926 on the coupon and mailing.

No. 6924—Hand Insecticide Applicator

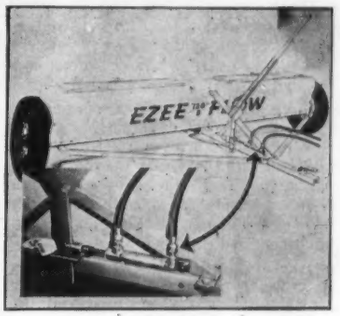
A hand applicator for use with Dri-Die Insecticide 67 has been designed by W. R. Grace & Co., Davison chemical division. The device consists of a polyethylene container to which two attachments can be fitted. One is a long nozzle to blow the powder into spaces where general distribution is desirable but not objectionable. The other is a spreading device which will roll the insecticide on a strip of surface accessible to the insects but which will avoid general dusting through the atmosphere. For details, check No. 6924 on the coupon and mail to this publication.

No. 6929—Sprayer Spacing Attachment

A device that the manufacturers say is the answer to varying row spacing and needed extra stability for high clearance self-propelled spraying equipment has been announced by Century Engineering Corp. The unit is called the No. CHC-31AT, and is a telescoping device that can be attached to the rear frame of a high clearance carrier to permit the rear wheels to be adjusted anywhere from 72 in. to 150 in. It is available with new equipment or can be added to Century carriers now in the field. With the attachment the equipment can be used on unlevel ground and on seed beds up to 6 ft. wide. For more details check No. 6929 on the coupon and mail.

No. 6922—Spreader Accessory

Ezee-Flow Division of Avco Distributing Corp. announces the availability of a "hydraulic control" ac-



cessory that fits all Ezee-Flow spreaders. The hydraulic control cylinder automatically opens and closes hopper shutters by a single lever. It is no longer necessary to operate hopper shutters manually. The lever is on the tractor seat. Full details and a fertilizer application guide are contained in a booklet available from the company. Check No. 6922 on the coupon and mail.

Books on Pesticides

THE GARDENER'S BUG BOOK (1956)
Dr. Cynthia Westcott

The Complete Handbook of Garden Pests and their control. Information, scientifically accurate but easy to read on 1,100 insects, mites and other animal pests that attack trees, shrubs, vines, lawns, flowers, fruits and vegetables in home gardens. Illustrations in full color. Control measures combine the latest in chemical developments with time-honored cultural measures. Helpful to all who serve the general public and to truck farmers and fruit gardeners. 579 pages, cloth bound $7.50

HANDBOOK OF AGRICULTURAL CHEMICALS —Second Edition
Lester W. Hanna, Agricultural Enterprises, Forest Grove, Ore.

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Harold H. Shepard, chief, Agricultural Chemicals Staff, Commodity Stabilization Service, U.S. Department of Agriculture, Washington, D.C.

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Harold H. Shepard, Entomologist, U.S. Department of Agriculture, formerly Associate Professor of Insect Toxicology, Cornell University.

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Edited by R. L. Metcalf, University of California, Citrus Experiment Station, Riverside, Cal.

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INSECT, FUNGUS AND WEED CONTROL
Dr. E. R. de Ong

The information is grouped according to field of application rather than to chemical composition or nomenclature. Chapters on insecticide label, seed disinfectants, herbicides, forest insects and diseases, livestock insects, and the pests found in household and industry. Fumigation of warehouses, residual sprays and preservatives for fruits, vegetables and wood products are covered. An up-to-date guide on pest control with the needs of operators, agricultural and structural specialists carefully considered. Shippers and warehouse personnel will find the book useful $10.00

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Is Your Store a Sales Builder or Barrier?

By R. M. Baker
Manager, Marketing Projects
Kawneer Co., Niles, Mich.

How attractive are today's small retail stores? Do they impress potential customers—or do they appear to be mere over-grown storage spaces or shelters from the weather?

Well, many specialists claim that a large number of retail stores in this country are outdated in appearance and archaic in their merchandising facilities. They are "sales barriers," and they actually cost their owners uncounted dollars in might-have-been sales.

The Magic Word. Can something be done to convert these stores into "sales builders"? Certainly. And the magic word: modernize. To modernize does not mean simply putting up a shiny new neon sign or installing a streamlined cash register. It might include such items as a new store front, storage facilities, lighting fixtures, mirrors, floor covering, shelves, tables and chairs. And the store's New Look might also include an air-conditioning unit.

But (you object) doesn't such modernization cost money? Of course. Well, then, can most small retail stores afford to modernize? The answer is simple: They probably can't afford not to. To be sure, it may be that it will take time to recover the money invested in modernization. But meanwhile there are other benefits you can derive from it: Your employees' morale may improve; you may find it easier to hire new personnel; your customers will think more highly of you; and the new look may put new life into your enterprise and keep it on par with the competition. Of course, whatever money is spent—and the amount varies—must be spent wisely.

Some retail store operators modernize their stores, inside and out, all at once. You don't have to do that (though it's the most economical procedure). But, in any case, modernization works. To see just how well it can work, here are a couple of actual case histories of stores that modernized themselves right into success. But a word of caution: Face lifting is fine, but don't forget the store's other functions: good service, good merchandise, good selection.

Modernization Breeds Success

In 1954, Clinton (name disguised) was a small town in a big economic slump. Business conditions in general were affected by a nationwide recession, and the largest manufacturing plant in town had closed down. Purchasing power was restricted and the people of Clinton were being cautious with their money. During that year Rex Porter (name disguised), a florist who had been in business in Clinton for many years, increased his sales by 45%. They jumped from $29,000 in 1953 to $42,000 in 1954. One reason for this unusual spurt of Porter's sales curve was a complete modernization of his sales room in late 1953.

The Jeppson Auto Supply Store in Wrightville (name disguised) began to feel the competitive squeeze of new shopping centers in 1956. In order to bring in more customers management decided to give the store a face lifting. As a result, sales climbed 26% during the following year.

These are not cited as extraordinary examples: they are merely typical case histories illustrating the beneficial effect of transforming outdated stores which have become sales barriers into attractive sales builders. There is nothing particularly mysterious about this. Money spent on modernization—if spent wisely—can make your enterprise into a real sales builder. After all, the appearance of your store is a potent form of advertising. The thousands of potential customers passing your store are either attracted to it, or they are not. They are either favorably impressed or they are repelled. Either way, your store is constantly broadcasting advertising impressions. When your store is advertising favorable impressions, store traffic will go up. But if the message is unfavorable, your sales will suffer.

How can you determine whether or not your store is one of these which is paying the high cost of obsolescence? There are four simple tests that you can apply to your own store.

Tests for Your Store

● **Across the Street Look.** How long has it been since you took a few minutes away from the routine of business to make an objective evaluation of your store? Walk across the street, and assume the critical frame of mind that the shopper has when deciding where and what to buy. As you examine the store, ask yourself these questions: "If I were a shopper, would that store create a favorable first impression on me? Would I be attracted to that store? Would I want to go in?"

Next, take a few minutes during, say, the lunch hour, and use them to watch people passing your store. Is their attention attracted to your shop and window displays? Do many passers-by stop to window shop? Do many of them actually enter the store?

● **The Cash Register Test.** Now, check your sales record for the last several years. During those years consumer income has gone up. How have your sales been performing while those customers have been spending all that money? If your sales have increased only slightly, or remained level, or even gone down slightly, you have an indication that your store is not attracting its share of that increased consumer income.

● **The Comparative Test.** How does your store compare with others in your area? Have competitive stores taken any substantial number of old customers away from you? Is your store keeping up with others in appearance? Is your store as attractive as competitive stores in nearby communities and shopping centers?

● **The Time Test.** This is the most concrete and important indicator of your store's need for modernizing. Has it been over 10 years since the shop had a complete or even partial face lifting? If so, better have another look to see if some modernization might not be indicated. After all, you would not run the same newspaper advertisement day after day or keep the same window displays indefinitely. For the very same reasons, it is important that your store be modernized perhaps every 10 years or so. Of course, there are some enterprises, such as antique shops, which may not want to do much modernizing, if any. But, generally speaking, aggressive merchandisers have learned from experience that modernizing usually pays off in a high level of sales.

Clearly, it is difficult to discuss modernization expenditures in specific detail and quote figures that have any meaning unless one analyzes the individual requirements of a particular store. There are, however, certain basic investment factors that apply generally. A typical example can best illustrate these principles:

Golium's jewelry store has been in business 31 years. The last time it had a complete face lifting was when Henry Golium, Sr., moved into the location in 1927. Through the years, a few partial changes have been made: The interior was painted; several new display cases were added; and a larger display window displaced the old, smaller one when the latter was damaged by a storm. But one day, Henry Golium, Jr., decides to "put up a good front," and go after additional business.

● **Adding the Estimates.** Having made his decision, Golium consults with various experts who can assist him in the planning of his remodeling; and he has obtained sketches, plans and estimates. Now he can accurately figure the cost of his program. It adds up to a total investment—including labor costs—that is in the range of sound planning for his operation.

New showcases and fixtures (retaining some of the old ones)	$4,200
New storefront and entrance, including new sign	3,600
New lighting fixtures	1,100
Interior decorating	600
New flooring	450
Total	$9,950

● **Return on Investment.** Henry Golium, Jr., realizes that sound financial planning requires that he add to the capital investment itself a fair estimate for financing charges (whether or not he actually decides to borrow the money). So he adds $820 to cover this item, bringing the total to roughly $10,770.

He knows that, on the average, the useful life of any improvements will be about 10 years. Now, sitting down with pencil and paper, he tries to figure out what such a long term improvement project will cost him—and how soon he may be able to pay for it.

For some time Golium has been making discreet inquiries, and has found out that some stores in his vicinity increased their sales by 20 to 25% as a result of modernization. But he wants to be conservative, so he uses 15% as his basis for estimating post-modernization sales increases. Because his current sales figure is about $100,000, he looks forward to an additional $15,000 worth of business per year.

Using an average gross margin of 35%, he determines that his additional gross profit would amount to $5,250 per year. Because his overhead will not go up materially as a result of the complete renovation, he figures that nine tenths (or about $4,725 of the higher gross profit will be net profit. Of course, the amortized cost of remodeling (about $3,590) is subtracted from the increased profit. In other words, the 15% increase in sales he hopes to achieve will give him an additional net profit of $1,135 per year over and above the amount he will pay out for his store modernization work.

Borrowing $9,950 at 5.5% for three years, Golium's total bill will come to $10,770. With a projected profit increase of $4,825 per year, he feels that his modernization can be paid for comfortably.

● **Pay as You Profit.** Golium realizes that if he actually makes a lump cash payment for the modernization, he will be depleting his working capital rather seriously. So, instead, he decides to arrange financing with his bank. He finds that there are several methods of accomplishing this, including non-secured personal notes, mortgage liens, and chattel mortgages. After discussing with his banker these and other ways to obtain the funds he needs, Mr. Golium arranges financing on a mortgage lien which spreads his payments over the proposed 3-year base.

Planning for Modernization

There are several people who can and should be called upon to assist you in planning your modernization program. First, talk to your banker. His advice on how much to spend and how to finance the project can be invaluable. You might also want to consult your trade association or a professor of retailing at a nearby university. About cost factors you can talk to local storefront and other dealers to get ideas and estimates. Such specialists in remodeling will be glad to examine your facade, and make recommendations for solutions, provide sketches and cost estimates, all free of charge. Likewise, many fixture firms provide a free consulting service that will enable you to get sound ideas for your interior layout and traffic plan. Ideas and information on lighting systems can usually be obtained through your local electrical company. Whenever possible it is advisable to take your tentative ideas to an architect (at a fee, of course) who has the experience required to convert your wishes into an outstanding and functional store plan.

Design—Unusual or "Ordinary"? It is quite common for the retailer who is contemplating modernization to take the approach that "My customers won't like anything fancy or unusual. Keep the design simple." However, there are numerous indications, based on case histories of successful stores which have achieved outstanding results in sales increases, that the contemporary shopper is more design-conscious than in years past, and that he or she appreciates good design. This reasoning applies just as much to unusual approaches as to the more conventional ones. Keep in mind, too, that good design may be as cheap in the long run as poor design. The latter, in fact, can be more expensive, both in terms of installation costs and in terms of its lesser customer "draw." So, generally, good design is good business.

Planning With Care. As you get into the planning of the modernization project, you will find many of your decisions hinging on the basic question of whether to go all out or whether to keep costs down to rock bottom. For example, in the design of the storefront you may have the choice of face lifting the street level

SUMMARY

Many retailers at one point or another wonder what's wrong with their stores. Customers used to flock in; sales were high; profits kept at a good level. Yet, little by little, the golden flow of customer traffic was cut way down. Why? Well, have you really had a good look at your store lately? Is it impressive from the outside, clean and attractive on the inside? Has it had a face lifting in recent years? If the answers to these questions are No, it's probably time you did something about it. It's time, in fact, to see if your store needs modernizing. This Aid tells you how and—more important—why you probably should modernize. And the answer, again, is simple: Remodeling may change your store from a physical sales barrier into a sales builder. This report is published with the cooperation of the Small Business Administration.

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only, or continue it to include all two or three floors. Of course, remodeling that extra area will involve considerable additional expense, but it may also add a great deal to the pulling power of your store.

Of course, there are practical limits to the extent of any modernization project. You should not, obviously, go overboard to the extent that you jeopardize your solvency or impair your working capital to such a degree that you will have difficulty in maintaining an adequate inventory. It will not help much to increase store traffic 20 or 30% if your stock is inadequate and potential customers find the selection too skimpy—and walk out. Here is an area where discussions with your banker, trade association or business school professor can be of great help in steering a steady course between too much and too little investment.

Beware of Bargains. In obtaining estimates and quotations on the remodeling, you may encounter some remarkable "bargains," estimates that are unusually low. Of course, these can be legitimate bids based on satisfactory materials and workmanship. But examine these suspiciously low figures carefully. As a businessman, you know that you generally get only what you pay for. Such a bargain, therefore, may not include the caliber of workmanship you want for your store.

Modernizing in Stages. Perhaps you are not in a position to do a complete, inside and out, modernization job all at once. Certainly it is desirable to do a complete, integrated job of modernizing rather than attacking the problem piecemeal. Not only is it more economical to do everything at one time, but the complete remodeling has a stronger merchandising impact.

But if you don't want to commit yourself to such a large expenditure all at once, you can plan to modernize the store in easy stages. Say, for instance, that the interior is a particular liability to your sales; the place to start then is inside. However, if the interior is providing a reasonably good sales atmosphere, it is normally advisable to start the remodeling at the front, because the storefront is one of the most decisive elements in projecting the store's character to the public and in building store traffic.

Regardless of the approach you are going to take in making your store over, it is important that you do a comprehensive job of planning at the outset. For example, if you eventually want to revise the traffic flow in and through the store, the entrances of the storefront should be planned and located accordingly.

The Lease. If you are leasing your store, your modernization planning must take into consideration certain special factors. The most important of these is your lease. In other words, the more extensive the modernization, the longer the lease should run to justify your investment.

At the same time you may wish to seek the cooperation of your landlord in the modernization program. But many landlords may wonder why they should participate financially. Actually, there are several very tangible monetary reasons that make modernization a sound business proposition for the building owner. First, the modernization is bound to make his property more attractive physically; second, it will make it a more productive asset. After all, a building that is allowed to go downhill is no asset either to its tenants or to its owner.

There are many practical methods of landlord-tenant financial cooperation.

Not a Panacea. Earlier in this Aid, mention was made of the impressive increases in sales and profits which have been experienced by thousands of modernized stores. But nobody should jump to the conclusion that a renovation of the physical facilities of the store will automatically solve all problems and insure business success. If there are other serious defects in the merchandising operation—incompetent sales personnel, inadequate inventory, poor location, lack of parking facilities, poor pricing practices—physical changes will not increase sales in your store.

REEDY'S

(Continued from page 9)

satisfied users and this builds up the confidence of the customer in our products and spreading service. After this contact has been solidified, our driver can just about figure out his own delivery routes in the future and even start spreading fertilizer without first talking about it with the customer."

The business was started in 1932 by Mr. Reedy's father who worked right off his farm. As business increased, a move was made to a larger building that has since been converted into a complete farm store.

A program of continuous advertising, annual super meetings, radio spots, direct mail and personal visits to customers and prospects earned this dealer increased patronage year after year.

"We try to be a one-stop center for all farmers' needs," says Mr. Reedy, "and we keep adding whatever lines we find that farmers need. We have added such items as bulk milk coolers, pipeline milkers, water pumps, water boilers and even appliances. And of course bagged feed was always a part of our operation.

"Wherever possible, we demonstrate our products or urge the customer to meet us at a farm where the particular product that the customer is interested in, is already being used. We find that this type of relationship helps to convince the farmer on the wisdom of buying from us and this has been responsible for more customers buying more of their needs from us year after year."

One of Mr. Reedy's best sales tools has been his service department. He is in a position to service almost everything that he sells and this helps sales. He has a full time mechanic who is assisted by another, and both of them spend considerable time learning how to service and repair various product lines added by this farm store.

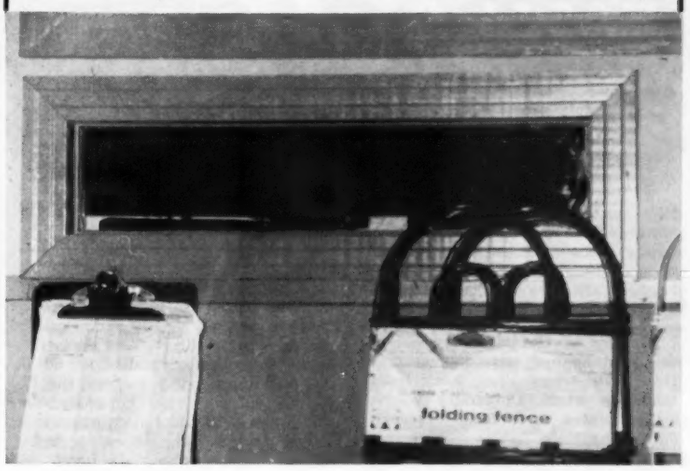
"Every time we add a new product or line, we endeavor to get proper instruction for the service or repair of these items to our mechanics," says Mr. Reedy. "Take water pumps for example. They have been instructed in the proper service of every line that we handle. And we back up our products with a large parts department. We point this out to customers and this helps to sell them on buying from us. It is also our answer to customers who say that they can buy a particular product for less or depend upon mail order houses for some of these items."

Service has also been found to be a "door opener" to many replacement sales. Sometimes the cost of repairing a water pump or pipeline milker isn't warranted and the customer has a new one suggested to him. Trade-in allowances on used equipment stimulate replacing this equipment and a new sale is made.

In some instances, the farmer may retain his old equipment as a spare, or dispose of it himself. The farm store has little problem in disposing of trade-in equipment itself, as it is put in shape and advertised in the sale columns of daily or weekly newspapers that cover their marketing territory.

"We are constantly in contact with the county agents and cooperate with them as much as possible in bringing helpful information, guidance and advice to the farmers in our area," says Mr. Reedy, "and this has also been a major factor in gaining the confidence of farmers in our ability to serve them to their best advantage."

One-Way Window Saves Dealer Money



A one-way window between the office and the display room has proved to be a worthwhile investment at the John Davis Feed Store, Big Spring, Texas.

"It's one of those glasses you can see through from one side," explained co-owner Jay Cunningham, "but from the other side is a dark mirror. The office is just behind the store partition there, so we built the glass head high to anyone sitting at the office desk. He can work and watch the store at the same time."

The owner John Davis is usually in the office, and it is his job to watch things, especially when the store is crowded.

"It helps in two ways," said Mr. Cunningham. "Whoever is in the office can come out and help wait on customers during a rush or when someone cames in and we're all in the back."

Perhaps still more important is its usefulness in keeping down shoplifting. One of the owners can watch suspicious persons browsing through the store. Already the owners have found several shoplifters among people they wouldn't suspect. One woman in particular had a habit of slipping a bottle of insecticide or sprayer or something else off the display racks and then telling the owners she had bought it there a few days ago and would like to get her money back.

"Now, when she or others like her come in, we don't give them a chance to steal anything," said young Mr. Cunningham. "Whoever is in the office will give the signal if we don't see these people. We rush forward courteously and then stick to them like glue until they get discouraged and quit trying. This way we save merchandise without causing any unpleasantness."

The glass is about 2 ft. long and a little more than 6 in. high. It cost $6.95 from the glass company and was installed by a carpenter. Mr. Cunningham says it was a remnant and that the glass sells from about $6 to $7 per sq. ft.

"It's a good investment for any store owner," he said. "Since we increased our garden and farm products, our store traffic has more than doubled. I figure that window saves us enough every month in lost merchandise to pay for itself."

Texas Entomologists Publish Hopper Information

COLLEGE STATION, TEXAS—About 5 million acres of rangeland was infested with grasshoppers in the Panhandle area of Texas in 1958.

Of the infested rangeland only about one million acres were sprayed, leaving four million acres of infested land that received no control. Valuing the grass destroyed at the figure of $1.25 per acre, ranchmen in the Panhandle alone lost about $5 million worth of grass. Most of the grass could have been saved at a nominal average cost of about 60¢ an acre by spraying at the proper time.

Entomologists of the Texas Agricultural Extension Service have prepared a leaflet titled, "Grasshoppers Common to Texas."

The leaflet discusses the different species of grasshoppers found in Texas and their identifying characteristics. Also included is a discussion of the life cycle of grasshoppers from the time the females lay the eggs to maturity.

JOINS MICHIGAN CHEMICAL

SAINT LOUIS, MICH.—Dr. Cleveland B. Hollabaugh, consulting chemist and specialist in chemical patents, has joined the management staff of Michigan Chemical Corp. here. During the past 12 years, Dr. Hollabaugh has had his own consulting business in New York City and Stamford, Conn. Consultant to Michigan Chemical since 1953, Dr. Hollabaugh will concentrate on this company's growing chemical patent work although he still will be available to other firms on a part-time basis.

Calspray Elects Officer, Announces Appointments

RICHMOND, CAL.—The election of M. E. Wierenga to vice president and member of the board of California Spray-Chemical Corp. was the keynote of a number of staff changes and additions, announced by A. W. Mohr, president. In addition to his elected duties, Mr. Wierenga will act as manager of the marketing department.

The appointments included: Leroy C. Kennedy, manager of the foreign department; Charles M. Stutfield, manager of the credit division; Luke D. Dohner, manager of the Calspray branch office in McAllen, Texas, and John W. McGlynn, export documentations clerk, international department.

Named sales representatives were: Joseph T. Patton, in the Iowa area; Robert G. Schnabel, in the Nebraska area; Warren L. Maanum, in the Minnesota area; Arlan R. Semmen, in the North Dakota and western Minnesota area, and John R. McGilvery, merchandising sales in the northern Ohio area.

L. H. Butcher Names New Agricultural Chemicals Chief

LOS ANGELES—G. LeRoy Hillebert has been appointed manager, agricultural chemicals, for the L. H. Butcher Co., announced Victor M. Schwartz, executive vice president.

Mr. Hillebert has been with Butcher since 1935 and has served as salesman, sales supervisor and manager, agricultural chemicals for California.

Mr. Hillebert will make his office in Los Angeles.

FARM SERVICE DATA

EXTENSION SERVICE REPORTS

The unseen enemies of potato growers in the Red River Valley, namely virus diseases, are receiving the attention of plant pathologists at North Dakota Agricultural College.

Heading up the pathology end in the fight against potato viruses is Dr. A. P. Benson, just back from Michigan State University where he completed some basic research on the problem.

Some types of potato viruses are known to reduce yields as much as 30% and it's almost impossible to catch them at it. The diseased plant often gives no visible indication that a virus is at work.

This is why control of potato virus diseases is such a knotty problem for researchers. First, they have to identify which virus (and there are many) is causing the trouble. At NDAC that job falls on Dr. Benson who, with various research techniques, identifies and isolates a virus and then is able to screen for resistant potato seedlings. These he sends to NDAC plant breeders who use them to develop a resistant variety to that particular virus.

The case of "virus X" is an example. None of the commercial potato varieties grown in this area is resistant to "virus X." However, identifying this virus has already been achieved. According to Dr. Benson, it's done by mixing the juice of a suspected potato plant with rabbit serum. If the serum coagulates, the plant is known to be infected with "virus X." NDAC potato breeders think they'll soon have ready a variety resistant to it.

But that's only one virus. Dr. Benson lists others he expects to work on, for instance, virus Y, leaf roll virus, spindle tuber virus and the virus causing purple top wilt. All are threats to Red River Valley potato industry.

With basic research having unlocked the secret of virus identification and screening techniques for identification of resistant varieties, the NDAC pathologist thinks it's a matter of time before potato varieties resistant to all of the known virus diseases are developed.

★

"Phosphorus feeds clovers, while nitrogen feeds grasses, but a combination of nitrogen and phosphorus makes the best fertilizer application for pastures," according to Dr. W. E. Martin, soils expert from the University of California.

Dr. Martin was making recommendations for good fertilizer practices on irrigated pasture in California.

He cited the results of test plots in Sacramento County which demonstrated that a plot treated with 180 lb. of nitrogen and 160 lb. of available phosphate (P_2O_5) per acre produced a yield of 44,358 lb. of green forage per acre, while an unfertilized plot produced only 26,004 lb. of green forage. This meant an additional 3,591 lb. of dry feed per acre from the fertilized plot.

Dr. Martin pointed out that even when applying the highest costing combination of fertilizers, such as 200 lb. of nitrogen and 80 lb. of available phosphate per acre, there can still be a gain of $10 to $20 per acre in terms of additional beef produced.

Dr. Martin's recommendations to farmers for good fertilization of irrigated permanent pasture are as follows:

"Apply approximately 120 lb. available phosphate to new pastures or pastures not previously fertilized for the first year, then follow each year afterward with an additional 60 lb. per acre to keep the level at the 120 lb. phosphate mark. The application should be made just before rains in fall or early spring. Nitrogen should be applied, beginning in June, and 30 lb. per acre added at each irrigation, or the whole process of nitrogen fertilization can be done through irrigation water, sprinkler or flood, using 11 lb. for each 4 in. of water applied at each irrigation during the summer to get a total of 180 lb. of nitrogen on the field during the season."

★

Citrus nematodes, which infest more than half the groves in Arizona, have been economically controlled by addition of DBCP to irrigation water, the U.S. Department of Agriculture reported.

The treatment was even more effective when accompanied by pruning and hedging (sawing off a foot or two of branches on four sides of trees). These cultural practices helped the trees regain their normal vigor more quickly. The combination treatment resulted in better shoot growth, more uniform fruit, and better trees.

Nematologists H. W. Reynolds and J. H. O'Bannon of USDA's Agricultural Research Service found that 2 gal. per acre of DBCP (1,2-dibromo-3-chloropropane), in enough water to cover the ground to a depth of 4 or 5 in., controlled heavy grove infestations. The research was carried out near Yuma in cooperation with the Arizona Agricultural Experiment Station.

One treatment at this low dosage gave such good results that the scientists feel follow-up treatments won't be needed for at least five years. Applying in excess of 2 gal. per acre doesn't significantly increase nematode control, and more than 8 gal. per acre may injure trees.

Thorough coverage with DBCP is necessary for control. This can be done if the soil is in good tilth and free of weeds, and the ground is level.

Metering the chemical into irrigation water was done in several ways. Any method that mixed the chemical thoroughly into the water provided good control of the pests.

The scientists estimate the cost of chemicals, hedging and pruning at about $78 per acre over a 5-year period, or about $16 per acre per year.

The citrus nematode lives only on the outside of the roots and feeds by puncturing the root wall. This is not the same nematode that burrows inside the roots and is associated with spreading-decline disease so destructive to citrus in Florida.

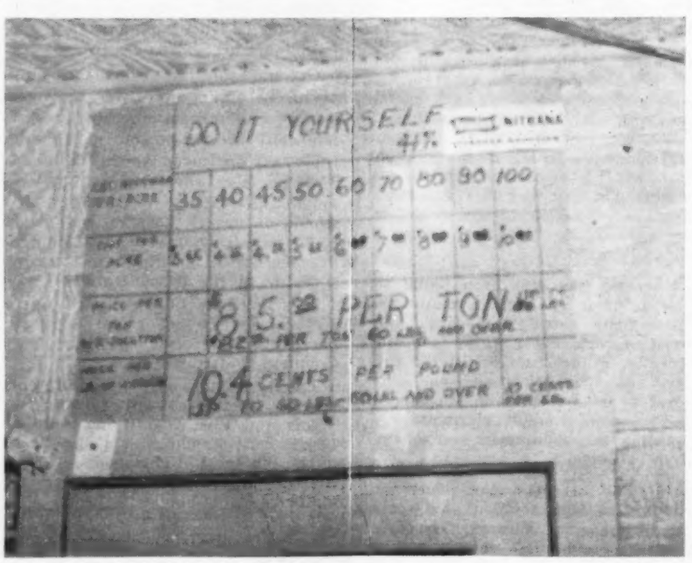
★

More frequent irrigations are needed to produce maximum cotton yields, according to Dr. D. E. Longnecker, agronomist at the Texas Experiment Station at Ysleta.

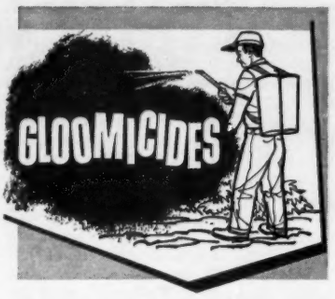
He says that tests at the station and elsewhere show that 14-18 day intervals are too long, and recommends that cotton farmers irrigate every eight to ten days in light soils and from 10 to 12 days on heavier soils.

Extra water pays off in higher profits. Five to $10 worth of extra water may produce $75 to $100 more lint cotton.

Dr. Longnecker says that while extra water increases yields more than extra fertilizer, they both are needed. He thinks farmers should strive for a two-and-a-half to three bale average with a good season ahead, proper fertilization and ample water.



THE WANAMINGO ELEVATOR, Wanamingo, Minn., posted a "Do-It-Yourself" price schedule for liquid nitrogen this spring, which interested many farmers who could see what it cost them to fertilize their acreages on various bases. The schedule told the farmer if he applied 35 lb. per acre the cost would be $3.65. The price scale then went right up the line to 100 lb. per acre which would cost the farmer $10 per acre. The price per ton was also quoted as being $85 per ton up to 60 lb. per acre and $82 per ton 60 lb. and over. The schedule said the price per pound of 41% liquid nitrogen was 10.4¢ up to 60 lb. and over 60 lb., 10¢ lb. A breakdown like this enabled many farmers to figure their liquid nitrogen costs in a number of ways, by poundage applied per acre, by acreage, and by tons. Many a farmer studying this chart was moved to discuss his fertilizer needs with officials of the firm, and wound up buying liquid nitrogen. Some customers applied the nitrogen themselves —others hired it done.



Women come in four general specifications: Thin, medium, plump, and "Get a load of her!"

★

One supervisor was telling another, "When I walk through the typist section I feel like a piece of uranium approaching a whole battery of geiger counters."

"What do you mean?" the other man asked. "The closer I get the faster they click!"

★

"Is this Peabody, Finchley, Longworth, and Fitzgerald?"

"Yes, this is Peabody, Finchley, Longworth, and Fitzgerald."

"I want to speak to Mr. Smith."

★

The big city reporter stopped at a little rural newspaper office. During the conversation he asked the elderly editor, "How do you manage to keep your circulation the same all year 'round in a town where the people know what everyone else is doing?"

The country editor grinned a little and replied, "They read the paper each week to see who's been caught at it."

★

"He's not as big a fool as he used to be."

"Getting wiser?"

"No, thinner."

★

A davenport held the twain.
Fair damsel and her ardent swain;
Heandshe.
But then, a step upon the stair!
And father finds them sitting there:
He . . . and . . . she.

★

The bachelor is a cagey guy
Who has a lot of fun.
He catches cuties on the fly
And never Mrs. one.

★

A salesman's wire: "Stopped by hurricane, please wire instructions," was answered from head offices with: "Begin summer vacation, effective yesterday."

★

A Texan, wife and little son entered a Carlsbad bar and when the Texan ordered two straight whiskies Sonny spoke up: "Hey, Pa, ain't Ma drinkin'?"

★

A little boy was busily practicing the piano when a salesman came to the door.

"Is your mother at home," asked the salesman.

"What do you think?" replied the boy.

★

A girl and a young man were sitting on her couch discussing intellectual things such as telepathy. "Would you call it telepathy," the girl asked, "if I were thinking about the same thing you are?"

"No," the young man replied, "I'd call it just plain luck!"

★

The origin of the expression, "hurrah for our side!" goes back to the crowds lining the streets when Lady Godiva made her famous sidesaddle ride through the streets of Coventry.

HURT

(Continued from page 9)

Hurt said, "but it's something anyone selling insecticides could use profitably. When a woman comes in and says worms are on her tomatoes, we walk over to the insect rack and she identifies it. We then prescribe the chemicals needed and sometimes sell her a spray gun and other items. This collection of samples has materially cut down on our inspection trips to identify plant troubles."

Mr. Hurt handles only national brands of fertilizers and insecticides. He takes advantage of all the national advertising offered by the manufacturers, accepts their help in training his employees and dealers and works closely on promotional campaigns.

Each employee at the company is trained to sell products. Mr. Hurt says many dealers never take the trouble to train workers in this important field. He gives them all the information they can absorb, requests that they show the greatest courtesy and friendliness in talking to customers, and that they always mention the products and services offered by the store.

"A good selling effort by all personnel will sometimes give you a 10% increase in sales within a week's time," he said. "Show people what you have, find out their problems, then try to help them with the solution."

After building the store, Mr. Hurt partitioned off a large side room and has it filled with sacked fertilizer and insecticides. Sacks can be carried out through the reception room or they can be loaded on trucks and pick-ups at the rear.

At one time Mr. Hurt had a spray truck and crew for spraying trees and shrubbery, but is now trying to get out of this phase of operations. He says it is too expensive for customers who may need to spray three or four times.

"We can save them money by selling the materials and showing them how to use it. We prefer to be known as a retail store and information center for everything from termites to cotton insects."

OSCAR & PAT

By Al P. Nelson

An old, red Buick moved slowly along the West Virginia turnpike at about 45 miles per hour. The driver was a tall, lean fellow of middle age and he had his right arm around a lissome dark haired woman, also of middle age.

Now and then the tall man would quickly kiss the dark haired woman, and the car would weave a little. Several drivers honked at the weaving vehicle, and gave it a wide path when passing.

"Oh, Pat," said a flushed, shining-eyed Nora, "do you think you ought to kiss me so much—in public? And on the turnpike?"

"I'm happy, me dear, that's why," Pat grinned impishly. "I may not kiss you for six weeks when I get back into business with old Oscar. Better take your kisses when you can get them. Man, what a time I had at the NPFI convention. Never saw so many pretty women in my life at that banquet. But, me dear, you were the prettiest one of all."

Nora tried to frown. "Well, I'm glad you said that!"

"I've got my head so filled with good business building ideas from that convention, I think sometimes it'll burst," Pat said. "I can hardly wait until I get back and put some of them to work."

"Oscar will cool you off quickly enough," Nora said sagely.

Pat chuckled. "Oh, I had almost forgotten there was such a person as Oscar. Why, Nora, I met and talked with Dr. Coleman. And Paul Truitt. And Louis Wilson, and Drs. Tisdale, Bahme and others. I made notes at the sessions, until I've got three notebooks filled."

"And I have had a wonderful vacation with you, Pat. But it must have cost an awful lot. How much did it cost, Pat?"

Pat laughed and waved his hand. "Pay no attention to the cost, me dear. It was well worth it. Wait till I get back and put these ideas to work. They'll help me make more sales—the money will roll in and then I can demand a bonus from the firm. Oscar can't stop me. We're doing better than last year."

"But," said Nora practically, "suppose that business isn't better at the end of the year. Suppose egg, pork and milk prices aren't up as much as farmers want. Business could be harder to get. We've got to be practical you know."

Pat laughed again. "There you go, talking just like Oscar, me dear. Remember, we have to think Big, act Big and work Big. If a person is going to be satisfied with a small potato, he will never get a big potato. So let's keep looking for that big break."

Nora snuggled closer to Pat again. "My big break was when I got you, Pat. Even if you hate to see a dollar stand still for very long."

"Why, Nora, you surprise me. I always like to keep a dollar working—not in a bank perhaps, but in equipment, in advertising, in sales promotion, where it can work for more than the 3% bank rate. What's so impractical about that?"

"It isn't impractical, Pat, but a business always needs a certain amount of capital to keep paying regular expenses. So—sometimes promotions have to be limited to the proper season of the year."

Pat became silent for a moment. "What are you trying to tell me, dear? Out with it."

A driver behind Pat's Buick honked now as he passed just to make sure that the one armed driver ahead didn't swerve out into the other lane.

"You got so many valuable business ideas at the NPFI meeting, dear, that you are so excited about them, you want to get right home and put them all into action, don't you?"

"You bet!"

Nora nodded. "But you have enough ideas to last for months or more. If you tried to institute them all at one time, you'd worry poor Oscar and that really would cost a great deal."

"So—"

"Well, I would go slow on using those big ideas, if I were you. I'd use them one at a time, and space them apart a month or so. Are you terribly disappointed in me, dear?"

Pat squeezed her waist. "No, I know you too well to think you'd lie to me. You always speak the truth. I should slow down on the ideas, eh, feed them to Oscar and the public painlessly over a period of time? No overnight change into a dynamic merchandising policy."

Nora shook her head. Her eyes were full of understanding as she looked at Pat. "I had a great deal of time to visit with the institute men's wives while the business sessions were on. We women like to visit you know. I found out, Pat, that some of the wives have to hold down their husbands' big business ideas now and then, too. Have to make them take progress in stride."

Pat chuckled. "I'll bet you learned more at this convention than I did."

"I learned a great deal. Pat, will you take a suggestion?"

"Depends what it is."

Nora sighed. "Well, when you get back, why don't you be real co-operative with Oscar for the first three mornings or so?"

Pat frowned. "What do you mean?"

"Well, ask him for a list of delinquent accounts, and then go out and collect real hard for two or three days. Make a real effort. Put off those new sales promotion and advertising ideas you got at NPFI for a half week. That isn't too long, is it?" Nora's voice was pleading.

Pat threw back his head and laughed. "Well, you little ol' psychologist," he said. "You see, I know I married a smart woman. You mean, I should co-operate with Oscar his way—for once—and take the wind out of his sails."

"And then later he won't take the wind out of my sales—s-a-l-e-s," he spelled.

They both laughed heartily.

"All right," Pat said. "I'll promise, and you hold me to it. Oh, what a wonderful time we had at that convention!"

"Pat," Nora said with a note of worry in her voice, "I wonder how the children are? Do you think—"

"Ssh!" he said quickly. "Don't say anything about that. You put your worries behind you until you get home, and I'll put mine behind me. Nobody—nothing should spoil this vacation. Tomorrow? Well, that's another day."

OVER THE COUNTER

By Emmet J. Hoffman
Croplife Marketing Editor

Which of your farmer customers are most receptive to new products and new ideas? The University of Tennessee has completed a research study to find out which farmers will most readily adopt a new practice, a new product or a new idea. The summary will help a dealer spot customers who are the best prospects for a new development.

Full-time farmers and farmers under 47 years of age adopted significantly more of the eight recommended practices included in the study than did part-tim farmers. So did the operators of large farms as opposed to the operators of small farms and livestock farmers versus farmers with crops as the major enterprises. The more highly educated the farmer or his wife, or if the farmer had had some vocational agricultural training, the more practies were adopted also.

What farm practices were studied? They were planting a recommended hybrid corn variety; soil testing for fertilizer needs; seeding the proper grass-legume mixture for pasture; clipping pastures for weed control; chemically treating tobacco seed beds for weed control; treating tobacco beds chemically to control wildfire; vaccinating heifer calves to control Bangs disease and inoculating dogs against rabies.

It was also found that farmers who take part in church, farm cooperative, lodge and PTA organizations adopt more of the above practices than do non-participators. And the farmers who take part in those organizations take part more in organizations as a whole.

Farmers who said that their county agent was the most important source of farm information had adopted more new practices than had farmers who didn't list their county agent first. But both had higher adoption scores than farmers who did not mention their county agricultural agent.

As far as the social and wealth combination went, the socio-economic status of farm families was higher in the communities with clubs than in those without clubs.

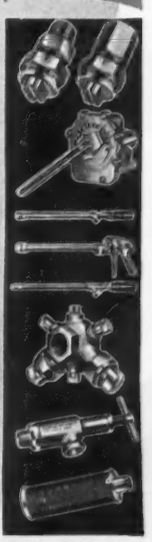
California Chemical Employment Shows Gain

SAN FRANCISCO — Employment in the chemical manufacturing industries in California took another climb during April, rising to 38,500 during the month from an estimated 38,100, reports the Division of Labor Statistics and Research of the California State Department of Industrial Relations.

The upward trend virtually completes the recovery enjoyed by the industry during the past several months, over the employment slump suffered during 1958. A year ago there were an estimated 37,100 wage and salary workers in the industry in April, a decline from the March figure of 37,300.

Production workers in agricultural chemicals dropped their average weekly earnings during the month from $106.87 in March to $102.72 in April, which figure compares with $94.19 during the previous April. Hourly earnings in this group declined from $2.44 to $2.01 between the two months, and these compare with $2.32 in April of 1958. The work week was longer, too—up to 52.8 hours in April, and only 40.6 hours the previous April.

SPRAY NOZZLE REFERENCE DATA
Yours for the asking!



TEEJET SPRAY NOZZLES with interchangeable orifice tips... write for Catalog 30.

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SPRAYING SYSTEMS CO.
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BUG OF THE WEEK

Mr. Dealer—Cut out this page for your bulletin board

Rose Leaf Beetle

How to Identify

The rose leaf beetle is a small, oval-shaped metallic-green beetle, about ⅛ in. long. They are most numerous in suburban gardens near uncultivated fields. They usually appear late in May or early in June.

Habits of Rose Leaf Beetle

Actually, little is known about this insect, but it is believed that the larvae live in the soil and feed on the roots of various plants beneath the surface. The beetle's scientific name is Nodonota puncticollis (Say).

Damage Done by Insect

In addition to feeding on roots in the larval stage, the rose leaf beetle, as an adult, feeds on a number of flowers in addition to roses. It attacks iris and peonies and also on the tender shoots, flowers and foliage of crops such as blackberries, raspberries, strawberries, clover, peaches, pears and plums. Frequently the beetles swarm over flowers and in a very short time riddle them with shot-like holes, thus retarding growth of the plants and making them unfit either for marketing or for esthetic enjoyment.

Control of Beetle

According to literature on the subject, no satisfactory control for the rose leaf beetle is known. The difficulty lies in actually reaching the bugs with the dust or spray. Many of the pests are working within the buds or flowers and ordinary means of application of insecticide frequently fail to contact the culprits. Some of the literature advises jarring the bugs into a pail of water covered with a film of oil, or by picking the beetle-infested flowers and dropping them into the container. Early morning or at dusk is described as being the best times for such operations.

Illustration of rose leaf beetle furnished Croplife through courtesy of U.S. Department of Agriculture, Washington, D.C.

Efficiency of Air-Blast and Fixed-Boom Sprayers Found to Be Equal in Recent Test

WASHINGTON — An air-blast sprayer used properly should permit as good control of most row-crop diseases as the more widely used fixed-boom sprayer, according to U.S. Department of Agriculture and state scientists.

This conclusion was reached after equally excellent results were obtained in comparing the efficiency of an experimental air-blast sprayer and a standard commercial fixed-boom hydraulic sprayer to apply the fungicide maneb on different plots of tomatoes. The tomatoes were severely infected with late blight and anthracnose fruit rot.

Dr. John D. Wilson of the Ohio Agricultural Experiment Station and Frank Irons of USDA's Agricultural Research Service conducted the tests last season at Wooster, Ohio. Ideal weather conditions and severe disease conditions afforded a long-sought opportunity to compare efficiency of the sprayers, the scientists said.

Almost 100% of late blight and some 80% of anthracnose infections were controlled by maneb applied with either type of sprayer. Treatments were made every 8 days from July 18 to Sept. 18.

The air-blast sprayer treated swaths of 12 tomato rows, each 6 ft. apart. First one side, then the other, of each 72 ft. swath was sprayed. Percentages of disease control near the center of each swath were slightly less favorable than at the edges, indicating that air-blasting of still wider swaths would be unsatisfactory.

Air-blast sprays of maneb were equally effective at the 3-lb.-an-acre rate in 10, 20 and 40 gal. water. Pump pressure was 60 p.s.i. (pounds per square inch), and the force of the air pattern was distributed to avoid plant damage. The fixed-boom sprayer applied 3 lb. maneb in 160 gal. water an acre at a pressure of 300 p.s.i.

The scientists caution against air-blasting if wind velocity exceeds 10 to 12 m.p.h., and treatment of excessively wide swaths. They recommend sufficient spray material and air pressure to cover the plants well, and treatment often enough to insure constant protection.

NEMATODES

(Continued from page 1)

limits of the pest's spread. Visible damage is already showing up in some areas.

Nematodes can destroy a soybean crop. The only known habitats of the pest outside of the U.S. are in Japan, Korea and Manchuria.

The nematode infests three U.S. areas. One area includes parts of Arkansas, Missouri, Kentucky, Tennessee and Mississippi along the Mississippi River. Another is along the south coast of North Carolina where the pest was first found in the U.S. in 1954. The third area consists of several northeastern North Carolina counties and an adjacent southeastern Virginia county.

Nematode surveys, cooperative between the states and USDA's Agricultural Research Service, have been made from 1954 through 1958 on almost 2 million acres in 26 soybean-producing states. A little more than 1% of the land surveyed — 22,714 acres — in seven states has been found infested.

However, the 1959 survey, already well under way in some states, has revealed extensions of infested areas in every known infested state except Mississippi where the nematode has been found on only one property.

A Japanese nematologist, Minoru Ichinohe, from whose studies and observations U.S. scientists gained much of their knowledge of nematode habits, is studying in this country at present under a Rockefeller Foundation grant. He will visit infested areas, meet with growers and other representatives of the U.S. soybean industry, observe state and USDA nematode research projects and furnish U.S. growers and scientists with knowledge which the Japanese have acquired in years of combatting the pest.

Southern Crops in Good Shape Despite Insect Pest Threats

MEMPHIS—A break in the weather the latter part of June enabled Mid-South farmers to move into fields to clean them of grass and weeds brought about by heavy rains. The major problem now facing farmers is the increasing infestations of boll weevils, thrips, fleahoppers and other insects.

The Mississippi cotton crop was reported generally as promising by extension service officials. Corn, soybeans, rice and pastures are in good condition. More horseflies were reported than usual, and hornflies also were numerous. A heavy infestation of boll weevils existed in the hill cotton and in some hot spots in the Delta.

Cotton choppers moved into the fields of Arkansas, but despite considerable progress, additional fair weather was needed to enable them to clean fields of grass and weeds. Growing conditions for cotton and other crops were said to be improved with warmer weather. The extension service reported a good early corn crop is silking, although high winds and heavy rains caused some damage in scattered counties. In some corn fields, budworms were giving trouble. Extension entomologists said boll weevil numbers are low in squaring and pre-squaring cotton, that spider mites are heavy around the borders of some fields, and that bollworms and aphids are light.

All crops were reported growing well in West Tennessee. Practically all small grain has been harvested, and pastures, while presently in good shape, are beginning to need rain.

Herbert S. Parham Named Marketing Chief For Monsanto Division

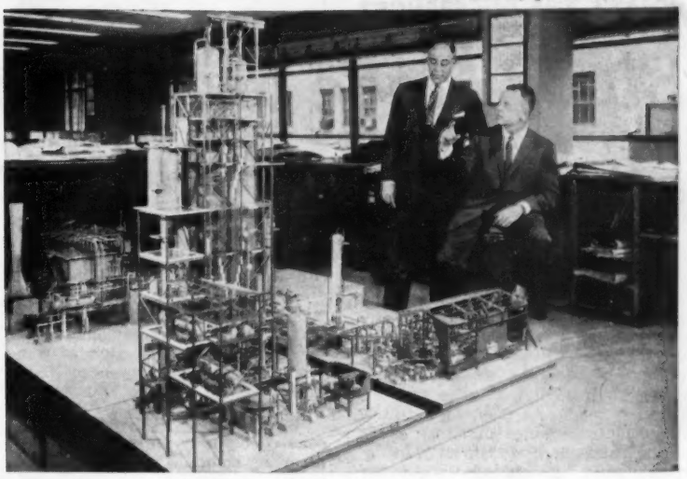
ST. LOUIS—Herbert S. Parham of St. Louis has been appointed director of marketing for Monsanto Chemical Co.'s Organic Chemicals Division, effective immediately.

Robert M. Morris, Monsanto vice president and general manager of the division, announced the appointment, filling a vacancy created by the appointment of Arthur P. Kroeger, former director of marketing, to the position of assistant general manager of the division.

Mr. Parham joined Monsanto in 1939 after receiving a BS degree in chemical engineering from the University of Missouri. He served in various production and sales capacities before his appointment in 1951 as product sales manager for intermediate chemicals. He was appointed assistant director of sales in 1955 and director of sales planning for the division in June, 1958.

Gilbert Alfriend Dies

ALBANY, GA. — Gilbert Hilsman Alfriend, native of Albany, and a former traffic manager for the Virginia-Carolina Chemical Corp., died recently at his home in Richmond, Va. After his retirement from the fertilizer company in 1956, Mr. Alfriend taught a course at the University of Virginia.



INSPECTING $30,000 UREA PLANT MODEL—S. S. Johnson, vice president, left, and James I. Harper, president of SunOlin Chemical Co., inspect accurate scale model of the firm's new $8 million urea plant, construction of which was begun on June 22. Announcement of construction was made at a New York press conference at which time the model was unveiled. Made by M. W. Kellogg engineers, the model is exact in every detail and will be used to familiarize key personnel with the plant's layout. When completed, the plant will produce 73,000 tons urea a year at its North Claymont, Del., location.

SUNOLIN

(Continued from page 1)

the equity capital for the new company was provided in equal amounts by the parent companies. A bank loan will provide additional capital to finance construction of the plant.

According to a company spokesman at the New York press conference, the joining of the Sun Oil and Olin Mathieson was a natural one.

"Sun Oil's largest refinery, located at Marcus Hook, Pa., in the industrial Delaware Valley, had excess ammonia capacity," he explained. "Olin Mathieson had an efficient sales organization in plant foods and organic derivatives and needed urea to round out its product line.

"Synthetic urea has a variety of uses in the agricultural and chemical fields. It makes a high nitrogen content fertilizer; it can be mixed with animal feeds to supply protein, and it has a wide variety of industrial uses.

"Daily raw materials requirements include 120 tons ammonia from Sun's refinery, 150 tons carbon dioxide to be produced by SunOlin's steam methane reformer and 9 million cubic feet of natural gas from Sun's gas fields in southwest Texas. The natural gas will be delivered via pipelines of the Transcontinental Gas Pipeline Corp.

"Five grades of urea will be produced by the new company. Prilled urea will be sold for fertilizer and industrial uses, and a special cattle feed grade will be made, in addition to a high-purity crystalline urea for leaf spray and industrial uses."

Mr. Johnson said the geographic location of the new plant is ideal to supply agricultural, dairy and beef-raising areas of the Eastern seaboard. Also, many of the large industrial consumers of urea are within a short distance of the site.

He said the company anticipates supplying the rice and cotton belts along the Gulf Coast and plantations of South America on a competitive basis.

SunOlin Chemical Co. was incorporated in October, 1958, and during that month a 13½-acre site was purchased at North Claymont, Del., adjacent to Sun Oil Company's Marcus Hook (Pa.) refinery. Since then, a $77,000 office building of approximately 3,500 sq. ft. has been erected at the urea plant site.

NEW INSECTICIDE—Charles Persing, director, agricultural research and development, Stauffer Chemical Co.; Dr. John Briggs, head, entomology department, Bioferm Corp., and Dr. John Megna, director of development, Bioferm Corp., discuss progress in the development of Thuricide, the microbial insecticide. Each gram of the new product contains 3 billion live spores of bacillus thuringiensis. Thuricide is being evaluated in a variety of field tests this year by Stauffer and Bioferm.

WHAT'S THE DIFFERENCE? . . .

Study Made of Agronomic Values Of Solid vs Liquid Fertilizers*

THE RAPID RATE of growth in use of liquid mixed fertilizers has occurred despite comparatively meager evidence as to their performance relative to conventional solid fertilizers. This situation apparently reflects the general viewpoint that crop responses from liquids and comparable water-soluble solids do not differ appreciably. Comparisons of liquid and solid nitrogen sources, under conditions which minimize losses to the atmosphere, seldom show measurable yield differences, although the specific behavior of nitrogen sources in soils initially may vary markedly. With respect to potassium, there are no apparent reasons why dissolved and solid salts should differ in effectiveness.

Based on limited published information, it appears, also, that crop responses to dissolved phosphates have not differed consistently from those obtained with water-soluble solids, with comparable placement and other practices. This presentation will be concerned chiefly with evaluation of the phosphorus component of liquid fertilizers as a nutrient source for plants.

The chemical composition of certain liquid fertilizers and of the saturated solutions of water-soluble solids is shown in Table 1. Solid water-soluble phosphorus fertilizers dissolve readily in soils even at moisture contents of field capacity and below. For example, a granule or spot placement of concentrated superphosphate in soil undergoes noticeable dissolution within a few hours as evidenced by formation of a wetted zone adjacent to the fertilizer. The solution emanating from the fertilizer has the composition shown in Table 1 (1, 6). Upon contacting the soil, this highly acidic solution dissolves large quantities of iron, aluminum, manganese, potassium, and other constituents (1, 6).

The resulting solution is supersaturated with respect to various complex iron and aluminum phosphates of varying solubilities, and these compounds begin to precipitate, e.g., taranakite with the formula, $H_6K_3Al_5(PO_4)_8 \cdot 18H_2O$. Dicalcium phosphate also precipitates abundantly at the site of application and in the wetted zone as it continues to expand into surrounding soil layers.

The saturated solutions of mono- and diammonium phosphates also react with soil to dissolve large amounts of iron, aluminum, etc. The NH_4^+ ions in the concentrated solutions exchange with soil calcium and other cations. Unpublished laboratory studies at TVA have demonstrated that complex ammonium-containing aluminum phosphates of relatively low solubility form in the clear filtrate obtained after reacting saturated ammonium phosphate solution with an acid soil. As expected, reaction of ammonium phosphate solutions with calcareous soils brings about precipitation of dicalcium phosphate. It is of interest that a complex ammonium aluminum phosphate (as yet not clearly identified) formed in the alkaline diammonium phosphate extract; struvite, $MgNH_4PO_4 \cdot 6H_2O$, also formed in the supersaturated filtrate (Lindsay and Stephenson, unpublished).

The nature of possible reaction products resulting from reaction of soils with liquid 8-24-0, 11-33-0, 0-55-0, 0-76-0, or dilutions of these, has not been determined. Perhaps solid diammonium phosphate and 8-24-0 solution would behave similarly since the solutions have about the same composition. Studies now under way with 11-33-0 solution should be of interest due to the presence of both ortho- and pyrophosphate and a high concentration of ammonium ions which enter into formation of complex iron and/or aluminum phosphates.

Reactions of phosphoric acid with soils conceivably differ from those involving solutions previously mentioned, since the multicomponent solutions provide some of the constituents other than phosphate ions involved in precipitation reactions. In contrast, the reaction system using straight acid would be determined by constituents dissolved from the soil and, hence, would likely depend to an even greater extent on the chemical nature of the soil.

In summary, it appears from preliminary studies that the concentrated phosphate solutions represented by mixed liquids or those formed on dissolution in situ of water-soluble salts are very reactive. Owing to variations in solution compositions and soil properties, an array of complex reaction products may form. The reaction products—not the materials initially applied — constitute the supply of plant-available phosphorus.

Studies are now in progress in the TVA laboratories to determine the properties of certain reaction products thus far identified, their stabilities in soils, and availabilities to plants. Preliminary studies (Taylor and Lindsay, TVA unpublished data) have revealed wide differences in availability to plants of various products; however, attempts to relate such data to relative source behavior at this time would be unwarranted.

Phosphoric Acid vs Solids

In the irrigated sections of the West, there has been interest over the past 15 years or longer in the use of phosphoric acid as a liquid fertilizer. Olsen et al. (7) compared late side dressings of concentrated superphosphate (CSP) and liquid phosphoric acid with CSP applied at planting for sugar beets on a calcareous Fort Collins loam. The late application of phosphoric acid was utilized to a much greater extent than was the late-applied CSP, and about as effectively as CSP applied at planting. It was concluded that liquid phosphoric acid applied in irrigation water would be a better source of phosphorus than band-placed CSP for late side dressing.

In another experiment on newly seeded alfalfa, solid fertilizers applied at planting time (April 25) were compared with phosphoric acid applied at first irrigation (June 28). On July 5, alfalfa had derived almost as much phosphorus from the liquid fertilizer (1 week after applying) as from solids applied 2 months earlier. Rate of uptake of phosphorus from the liquid source continued to rise during the next 2 months while uptake from CSP decreased. Fuller (4) also reported efficient utilization of sidedressed phosphoric acid for irrigated cotton.

It is possible that the greater uptake of phosphorus from phosphoric acid than from CSP observed on alkaline soils was due, in part, to greater distance of movement of the liquid from point of application (7). More recently, Schmehl et al. (9) observed little difference between phosphoric acid and monoammonium phosphate applied in irrigation water, or between the liquids and solid CSP or monoammonium phosphate in effects on yield of sugar beets or phosphorus derived from fertilizer.

Limited studies on acid, neutral, and calcareous soils of the humid regions have revealed no consistent differences in crop response to phosphoric acid and superphosphate. This is illustrated in an Iowa experiment with oats, shown in Table 2 (8).

Following development in 1956 of a process for making superphosphoric acid (76% P_2O_5), the ammoniated product, 12-36-0, and dissolved diammonium phosphate or liquid 8-24-0 were compared with solid CSP and diammonium phosphate in a number of field experiments conducted in Iowa, Nebraska, New York, Mississippi, Alabama, North Carolina, Virginia, and Georgia.

A preliminary greenhouse study conducted at Wilson Dam, Alabama, in 1956 (3) with some of these materials is summarized in Table 3. The following conclusions can be drawn from this experiment:

1. **On the acid Hartsells (pH 4.8) and near-neutral Houston (pH 6.8) soils, spot placement was consistently superior to mixed placement.**
2. **On the Hartsells soil in certain instances, one or both of the liquids gave significantly greater yields of dry matter and phosphorus than did the solid fertilizer. This result was more prevalent with the concentrated than with the less concentrated liquid.**
3. **On the Houston soil, there was no difference between liquids and solid.**

In the same greenhouse experiment, the effect on yields and phosphorus uptake of a fourfold dilution of the liquids with water was measured. These results are given in Table 4. In general, dilution had no effect when fertilizers were spot-placed. With Hartsells soil (mixed placement), dilution sharply reduced yields and phosphorus uptake but no such effect occurred with Houston soil. One might speculate that dilution had the effect of altering the nature of chemical reactions in mixed placement.

Results from the greenhouse study

TABLE 1. Composition of Liquid Fertilizers and the Saturated Solutions From Various Solid Fertilizers at Approximately 75° F.

	Initial composition of solution reacting with soil, moles			
Fertilizer	pH	P	Ca	NH_4
Solids—				
Concentrated superphosphate	1.5	3.98	1.44	...
Monoammonium phosphate	3.5	2.86	...	2.86
Diammonium phosphate	8.0	3.82	...	7.64
Liquids—				
8-24-0	6-7	4.22	...	7.14
11-33-0	6-7	6.32	...	10.61

TABLE 2. Effect of Concentrated Superphosphate and Liquid Phosphoric Acid on Yield of Oats

	Yield, bu./acre			
	Silt loam			Webster silty
Fertilizer*	Tama	Floyd	Nicollet	clay loam
No phosphorus	54.8	53.4	66.7	62.7
Concentrated superphosphate	70.2	58.4	78.3	85.3
Liquid phosphoric acid	68.0	58.7	76.1	89.2

*P_2O_5 was supplied at the rate of 30 lb. an acre.

TABLE 3. Yields and Phosphorus Uptake by Millet in Relation to Rate and Placement of Liquid and Solid Phosphorus Sources

		Hartsells fine sandy loam (pH 4.8)				Houston clay (pH 6.8)			
	P_2O_5 per pot,	Dry weight, gm.		P uptake, mg.		Dry weight, gm.		P uptake, mg.	
Fertilizer*	mg.	Spot placed	Mixed	Spot placed	Mixed	Spot placed	Mixed	Spot placed	Mixed
No phosphorus		0.8	0.8	0.9	0.9	5.5	5.5	6.7	6.7
Liquid ammoniated superphosphoric acid†	40	8.3	6.0	6.5	5.0	9.6	7.2	9.5	8.3
	80	11.3	8.7	9.6	7.4	..	..	..	..
Dissolved diammonium phosphate‡	40	8.5	5.4	6.5	4.4	9.3	7.9	9.4	8.7
	80	11.1	7.6	8.2	6.1	..	..	..	..
Solid diammonium phosphate¶	40	7.7	5.1	5.6	4.5	9.5	7.4	9.9	8.2
	80	10.3	7.0	8.1	5.8	..	..	..	..
L.S.D. (5%)		0.7		0.75		0.9		1.6	

*Nitrogen was equalized at 180 mg. of N per pot. Potassium was applied at 100 mg. of K per pot. Spot placement—four point locations 1½ inches below surface. Mixed placement—mixed throughout pot.
†10.5-36.8-0.
‡7.9-20-0.
¶21-53-0.

TABLE 4. Effect of Diluting Liquid Fertilizers on Yields and Phosphorus Uptake by Millet

		Hartsells fine sandy loam (pH 4.8)				Houston clay (pH 6.8)			
		Dry weight, gm.		P uptake, mg.		Dry weight, gm.		P uptake, mg.	
Liquid fertilizer*	Grade	Spot placed	Mixed	Spot placed	Mixed	Spot placed	Mixed	Spot placed	Mixed
Ammoniated superphosphoric acid	10.5-36.8-0	8.3	6.0	6.5	5.0	9.6	7.2	9.5	8.3
	2.6- 9.2-0	8.2	3.4	6.6	2.9	9.3	7.7	8.1	8.8
Diammonium phosphate	7.9-20 -0	8.5	5.4	6.5	4.4	9.3	7.9	9.4	8.7
	2.0- 5.0-0	7.8	3.8	6.1	3.4	9.5	8.4	9.8	9.8
L.S.D. (5%)		0.7		0.75		0.9		1.6	

*P_2O_5 was supplied at rate of 40 mg. per pot. Nitrogen was equalized at 180 mg. of N per pot. Potassium was applied at 100 mg. of K per pot. Spot placement—four point locations 1½ inches below surface. Mixed placement—mixed throughout pot.

*Paper presented at Tennessee Valley Authority pilot plant demonstration by George Stanford, soils and fertilizer research branch, TVA, at Muscle Shoals, Ala., June 10, 1959.

suggest that differences in effectiveness of liquids and solids might be expected on selected soils under field conditions. Indeed, the superiority of band placement of liquids has been demonstrated by Cook et al. (2) for corn in Michigan, and by Lamke et al. (5) for winter wheat in Nebraska. In experiments with wheat in Alabama (Ensminger et al., 1958, unpublished data), row application resulted in greater forage yields than were obtained from broadcast at two locations, while the opposite effects occurred at a third location. It also is true, in general, that water-soluble solid fertilizers are more effective when band-placed. This effect of band placement often is attributed to reduced fixation of phosphorus in the form of difficultly soluble compounds, which effect may be associated with minimizing the volume of soil reacting with the fertilizer.

Considering both published and unpublished data, representing 27 field experiments in which liquid and solid fertilizers were compared with the same methods of placement, there have been only three instances in which yields from liquids were significantly greater than from solids, and one instance of greater yield from the solid. In these cases, differences were small, and were not apparent on the same soil type in 2 succeeding years. Unfortunately, rather large experimental errors often are encountered in field experiments, in which cases differences must also be large to be significant.

Further basic work should be carried out to provide more definite answers regarding the chemical behavior of liquids and solids in relation to soil properties. More exploratory work is needed in greenhouse and laboratory to determine whether differences in availability are to be expected. For the present, it can be concluded that liquid phosphorus sources are at least as effective as any existing solid sources with proper placement. Economics, convenience, and factors other than agronomic, therefore, will govern developments in the near future.

REFERENCES

1. Brown, W. E., and Lehr, J. R.—Soil Sci. Soc. Am. Proc., 23, 7-12 (January-February, 1959).
2. Cook, R. L., Lawton, Kirk, Robertson, L. S., and Hansen, C. M.—Com. Fertilizer and Plant Food Industry, 94, 41-43, 46, 47 (June, 1957).
3. DeMent, J. D., Terman, G. L., Hunt-Charles M., and Clements, Lynn B.—Report on Wilson Dam Greenhouse Experiment 12, October, 1956; Soils and Fertilizer Research Branch, Division of Agricultural Relations, TVA.
4. Fuller, W. H.—University of Arizona Tech. Bull. No. 128 (June, 1953).
5. Lamke, W. E., Olson, R. A., and Grabouski, P. H.—Neb. Agr. Exp. Sta. Outstate Testing Cir. 70 (August, 1958).
6. Lindsay, W. L., and Stephenson, H. L.—Soil Sci. Soc. Am. Proc., 23, 12-22 (January-February, 1959).
7. Olsen, Sterling R., Schmehl, W. R., Watanabe, Frank S., Scott, C. O., Fuller, W. H., Jordan, J. R., and Kunkel, Robert—Colo. Agr. Exp. Sta. Tech. Bull. 42 (December, 1950).
8. Pesek, John, Webb, John, Meldrum, H. R., and Stritzel, J. A.—Iowa Farm Sci., 11, No. 10, 15-18 (April, 1957).
9. Schmehl, W. R., Olsen, Sterling R., Gardner, Robert, Romadal, S. F., and Kunkel, Robert—Colo. Agr. Exp. Sta. Tech. Bull. 58 (November, 1955).

Diamond Alkali Names New Staff Assistant

CLEVELAND, OHIO — Promotion of George W. Hottel, field salesman in Diamond Alkali Co.'s New York branch sales office, to staff assistant in the company's general sales and market planning department, Cleveland, was announced by H. B. Clark, director of sales.

Transferring to the post vacated by Mr. Hottel is Jack G. Redmond, field salesman at Diamond's Cincinnati branch sales office.

WORK ON STORED GRAIN

MANHATTAN, KANSAS—Donald A. Wilbur, Kansas State University entomologist, will spend the coming year working with insect infestation of stored grain in Mexico under a temporary appointment to the Mexican staff of the Rockefeller Foundation. Mr. Wilbur will leave for Mexico around the first of July.

SUGAR BEET PROJECT

ROCKY FORD, COLO.—A project aimed at increasing beet tonnage through use of fertilizers without decreasing sugar content of beets has been announced as a joint venture of Colorado State University experiment station and Arkansas Valley sugar beet growers.

California Quarantine Bureau Prepares For Busy Season

SACRAMENTO — The Bureau of Plant Quarantine, California Department of Agriculture, is preparing for its busiest season at plant quarantine stations located at the entrances to the state on all main highways. All regular stations will operate full shifts of inspectors and one seasonal station will be opened.

The purpose of the year-around, 24-hours-per-day plant quarantine inspection effort is to maintain California's protection against the introduction, establishment and spread of harmful insects, plant diseases, weeds or pest animals which are not now present in the state.

California, with a $2,800 million agricultural industry to protect, is a pioneer in the plant quarantine field. In 1881 it became the first state to adopt plant quarantine legislation. This was 24 years in advance of the adoption of federal legislation, the initial example of which was the Federal Insect Pest Act.

The records of 1958 show the importance of plant quarantine inspection to California agriculture. At 18 stations 4,734,770 vehicles were inspected from which 90,872 lots of plant material were intercepted. In the intercepted material, 13,782 lots of insects, 7,635 lots of plant diseases and 896 lots of weeds were found. Prominent in the interceptions were 15 lots of plant material which contained 20 specimens of cotton boll weevil and four lots containing 12 specimens of pink bollworm. These interceptions were of particular importance since neither of these two major pests of cotton, California's leading cash crop, are present in the state.

Dozens of other insect and plant pests were intercepted, among them many which attack citrus and other fruits. The work is carried on by approximately 175 plant quarantine inspectors assigned to border, maritime and other quarantine stations in California.

California Removes Two from 'Injurious' List

SACRAMENTO — The California Department of Agriculture has removed from its list of injurious materials the two organic insecticides Guthion and Chipman 6199.

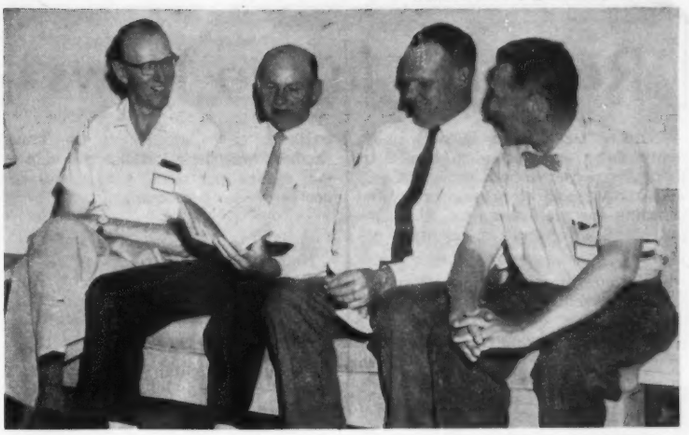
The action was taken following public hearings to consider information and testimony presented by the manufacturers of these two commodities. Regulations of the department classify certain pesticides as injurious materials and require that a permit from the county agricultural commissioner be obtained before these products are used.

Dealers are forbidden to sell the materials until they obtain a signed statement from the purchaser that he has a valid permit to use the materials.

The purpose of the regulations is to insure that these hazardous chemicals are used properly without endangering crops, people, livestock or honeybees.

The manufacturer of Chipman 6199 stated that the marketing of the preparation had ceased and would not be resumed in the future.

As a result of the department's action, a permit will no longer be required after July 3, 1959, from farmers who desire to use Guthion in pest control.



AGRONOMY OFFICERS—Officers of the North Central branch of the American Society of Agronomy are shown before one of the sessions of the annual conference on the Kansas State University campus at Manhattan. From left are: E. H. Rinke, University of Minnesota; R. V. Olson, Kansas State University; F. W. Smith, Kansas State University; and W. P. Martin, University of Minnesota. Dr. Olson was chairman of the meeting, while Dr. Rinke and Dr. Martin were co-vice chairmen and will be in charge of next year's meeting at the University of Minnesota. Dr. Smith is secretary-treasurer of the group. The annual conference June 15-16 was attended by more than 150 crop and soil scientists from a 13-state area.

Merck Scientist Reports on Tests of Microbial Insecticides

RAHWAY, N.J.—A new microbial insecticide—"Agritrol"—is proving its effectiveness in tests underway to control looper on shade-grown tobacco, Dr. J. M. Merritt, manager, plant product development, Merck & Co., Inc., chemical division, said here recently.

"Agritrol" is a formulation of a microbial pathogen, Bacillus thuringiensis. These bacilli produce spores and at the same time produce "crystals" which are toxic to the larvae of surface feeding, chewing insects. These include such major farm and forest pests as the bollworm, budworm, hornworm, corn borer, corn earworm and gypsy moth, according to Dr. Merritt.

Results from tests on shade-grown tobacco, being conducted at the University of Florida Agricultural Experiment Station at Quincy, are important, Dr. Merritt said, since leaves of shade-grown tobacco must go to market in perfect condition. A single insect-caused puncture of a leaf of wrapper tobacco can cut its market price as much as 90%.

At certain levels, "Agritrol" gave evidence of control of the looper in tests on shade-grown tobacco. Research is continuing at the Florida station to determine the ideal concentration against the looper and to establish its effectiveness against the tobacco hornworm and budworm.

Other experiments are being conducted during the 1959 season at experiment stations throughout the country, Dr. Merritt reported. These are to determine effectiveness of "Agritrol" in controlling the bollworm, cotton leaf perforators, insects attacking cole crops, the corn borer and corn earworm, and forest insects such as the gypsy moth and budworm.

NAMED ASSISTANT

SALEM, ORE.—The Oregon State Department of Agriculture has assigned a seasonal assistant to Ray Kelso, herbicide program supervisor, because of increased workload in this activity. C. L. Alexander, Milton-Freewater, has been transferred to Salem for this post. Mr. Alexander has been in charge of the department's federal-state shipping point inspection office at Milton-Freewater, now closed until production of new orchards demands full-time services. The herbicide application control program has grown 50 percent in number of applicators licensed in the last six years.

Modesto Student Wins CFA Grand Award

SACRAMENTO, CAL.—Mike Colt, a student of vocational agriculture at Modesto Junior College, Modesto, was chosen as winner of the grand award in the 1959 California Fertilizer Essay Contest, it was announced by the California Fertilizer Assn. The title of this year's contest was "Use of Fertilizer on Field or Vegetable Crops."

The CFA soil improvement committee is sponsor of this annual event, and its check in the amount of $100 was presented to young Colt on June 8 by Sidney H. Bierly, general manager of the association, before an assembly of the school's agricultural students. At the same time, the committee's perpetual trophy was presented to the school for possession during the coming year.

The winner is the son of the Edward Colts, who conduct a farming operation in the Modesto area. Mike plans to complete his scientific agricultural education at the University of California at Davis.

"The purpose of the contest is to promote a better understanding as to the economic value of the proper use of fertilizer," Mr. Bierly says. "The committee feels that it provides worthwhile incentive to both students and instructors of California's junior colleges to engage in fertilizer study, which will be beneficial to all concerned.

"Since the contest is open only to the two-year students of California's junior colleges, the same subject can be repeated every second year. The title of the 1960 contest will be 'Use of Fertilizer on Pastures and Rangeland'."

In addition to the grand award checks in the amount of $25 each were sent to the following authors of the best essay in each other competing school: Moyer V. A. Hubbard, Fullerton Junior College, Fullerton; John H. Jorgensen, Hartnell College, Salinas; Jim Locker, Orange Coast College, Costa Mesa; Kenneth Padgham, Pierce Junior College, Woodland Hills; Bill Mason, Ventura College, Ventura; and Charles W. Bird, Yuba College, Marysville.

Idaho Company Gets New Owners

ST. ANTHONY, IDAHO—Rey and Orme Jorgensen have purchased the Jack Thomas Grain Co., effective July 1. The company handles grain feeds, coal and fertilizers. There will be no personnel change. Cal Whitmore has been manager since Jack Thomas took over about three years ago from Miller Brothers.

Research in the News

Planting seed corn kernels with points down and flat sides parallel to the rows conserves soil moisture and may reduce cost of production by increasing the yield per acre, U.S. Department of Agriculture scientists reported.

Precise placement of kernels takes advantage of the natural growth habit of corn leaves. The leaves develop usually on opposite sides of a stalk and at right angles to the flat side of the seed from which each plant grows.

Known as "orientation planting," the method has been used successfully in cooperative experiments conducted by federal-state scientists at the Illinois Agricultural Experiment Station, Urbana. Dr. Doyle B. Peters and Joseph T. Woolley of USDA's Agricultural Research Service conducted the research.

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Well fed pastures pay farmers back with three times as much high quality forage as do unfertilized fields, reports Prof. C. J. Chapman, University of Wisconsin extension soils specialist.

"That's why it is profitable to give our pastures the plant food they're crying for," Prof. Chapman points out.

High nitrogen fertilizer has opened up unlimited opportunities for low unit cost milk and meat production from grass pasture, he says.

Prof. Chapman lists these benefits from pasture fertilization, based on results of 1958 Wisconsin demonstrations:

(1) You get direct and immediate returns on dollars invested in fertilizer.

(2) Adding high nitrogen fertilizer containing phosphate and potash, not only gives your cows a week to 10 days earlier grazing in spring, but it helps extend the pasture season into late July. It may also stimulate the growth of early clovers in the fall.

(3) The well-fed pasture is richer in proteins, minerals and vitamins. The thicker growth makes the turf deeper. This increases the soil's water holding capacity and slows down losses by run-off.

(4) Fertilized pasture chokes out many types of weeds and reduces the soil's water-holding capacity and slows down infestation by grubs.

(5) The higher yields from fertilized pasture save you money by cutting your cash outlays for protein feed supplements.

(6) More acres of good pasture promotes soil conservation and a grassland type of farming. The cows harvest their own feed, thus you save on man-hour and machinery costs.

●

Farmers are getting more crop growing power in the commercial fertilizer they buy, reports the midwest division of the National Plant Food Institute.

"Since 1950, the plant nutrient content of mixed fertilizer has increased from 28.18% to 38.86% in seven midwestern states," says NPFI. "In five other Corn Belt states, it has risen from 26.68% to 36.22%.

"As the yield-building power of the fertilizer has increased, the price has remained relatively steady. Economists point out that fertilizer prices have increased less than those of virtually any other item used in crop production.

"Yet fertilizer is most necessary to get top profits per acre."

NPFI said that one of fertilizer's prime values is that it helps farmers cut their costs of crop production. As costs go down, profits go up. Thus farmers and their families get a bigger return per acre, per bushel or per ton of crop production.

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Nematode-free garlic "seed" is being produced by University of California researchers in an attempt to halt further spread of the nematodes in commercial fields.

Supplies of the California late garlic seed—cloves, actually, since garlic does not produce true seed—are being increased in the Susanville area, according to Louis K. Mann, professor of vegetable crops at Davis. He selected the nematode-free stock from commercial varieties, and decided to grow it in Lassen County because that area has no commercial garlic production and farmers there are looking for a cash crop.

Mr. Mann is working on the stem and bulb nematode problem with extension vegetable crops specialist William L. Sims and nematologist Bert Lear at Davis. The pest is widespread in major California growing areas—Santa Clara and San Benito Counties—and threatens to become a problem in newer growing areas of Kern and Monterey Counties.

The nematode is spread in the cloves, and so far no practical treatment has been found to kill the pest once it is in the seed. Fumigation of a field before planting helps reduce the nematode population in the soil, but the pest soon spreads from infested cloves.

Small plots of the clean seed have been planted in the commercial growing areas to compare their yields with commercial plantings, said Mr. Mann. But the supply of the nematode-free garlic is not yet large enough to fill grower needs.

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Soil losses from continuous corn can be cut as much as 40% when minimum tillage methods are employed.

That's the report of Dr. R. L. Cook, head of Michigan State University's soil science department, based on research by the Soil Conservation Service in cooperation with the university.

Dr. Cook says there is a close tie-in between soil loss and water run-off. By cutting down on water loss, we not only have the advantage of more moisture for crops, but we save soil that would otherwise be lost through run-off.

Minimum tillage cuts down on run-off, says Dr. Cook, because it leaves the soil loose and open. Raindrops penetrate as soon as they hit. Most of the rain stays in the soil.

Dr. Cook says that conventional, or old-fashioned tillage methods tend to pack down the soil. These methods which work the soil until it is smooth and fine, require many trips over the field with tractors and other implements. As a result, the soil is frequently compacted and the pores are filled up. When rainfall comes, much of the water runs off, carrying topsoil along with it. That is particularly true on sloping fields.

Besides helping prevent losses of water and soil, minimum tillage can save farmers from $3 to $6 in land preparation costs per acre, Dr. Cook says. Another advantage is that it helps cut the hazard from weed competition.

Dr. Cook reports that where minimum tillage has been used on well fertilized soils, yields are just as high, or higher, than where more tillage was used.

AT AGRICULTURAL RESEARCH CENTER—Eli Lilly & Co. recently dedicated its new $5 million research center for agricultural sciences at Greenfield, Ind., with appropriate ceremonies. Above, left, a Lilly plant pathologist tests the value of various chemicals in protecting plants from diseases caused by bacteria, viruses, and fungi. These particular plants have mildew. At right workman prepares chemicals to spray for control of insect pests. Compounds are carefully formulated and uniformly applied to test plants. Dedication of the new research center brought together some 350 leaders in science, business and government for the event.

Lilly's $5 Million Agricultural Research Laboratory Dedicated in Recent Ceremony

INDIANAPOLIS—Eli Lilly & Co. on June 16 officially took the wraps off its $5 million research center for agricultural sciences located at Greenfield, Ind.

Some 350 leaders in science, business, government and the press from the U.S. and Canada took part in the full-day program in which the new center was dedicated.

The 500-acre center includes 15 new buildings and several previously existing ones. Here studies are conducted in animal nutrition, and animal and plant disease and pest control for both farm and home.

The new facilities comprise an administration building, power plant, veterinary laboratories building, incinerator, veterinary barn, and plant science laboratories building with 3 adjoining greenhouses. The facilities also include a feed mill, a 10,000-bird broiler house, 1,000-bird caged layer house, three swine barns, a 726-foot-long cattle-sheep barn, and cattle and sheep scale barns.

Dedication day guests were told by lead-off speaker Dr. T. P. Carney, Lilly vice president of research, development and control: "These facilities are concrete evidence of 'operation total effort' in our research program. We are interested not only in running the gamut of agricultural problems, but in all kinds of problems."

Dr. Carney said that although the major research effort will be in the area of medicine, agricultural research will be an important entity in Lilly's activities. "We have a reservoir of 1,300 minds in our research, development and control program whose knowledge is valuable in agriculture and other fields," he told the group.

Dr. E. L. Butz, dean of agriculture at Purdue University, told the dedication day crowd that agricultural research has boosted efficiency to the extent that one farm worker now produces enough food and fiber for himself and 25 others. In 1930, one farm worker fed and clothed only three besides himself. This increase in farm efficiency, said Dr. Butz, has released more workers from agriculture to produce other goods and services contributing to our higher standard of living.

Dr. Byron T. Shaw, administrator of the agricultural research service, USDA, welcomed the Lilly research center as a "valuable addition to our total national facilities for agricultural research, from which the entire country benefits."

INSECT NOTES

(Continued from page 5)

evidence of leaf feeding. Oviposition is virtually complete.

Sod webworm damage to lawn grasses was found in central Kansas last week. Webbing at the base of the plants and a lack of leaves are usually seen before the small white moths.—Leroy Peters and Dell E. Gates.

Arizona Cotton Farmers Watching for Insects

PHOENIX, ARIZ.—The cotton crop is making excellent progress and fruiting well in most parts of the state, except where insects are destroying many squares and bolls. Farmers should check their fields very closely for the appearance of Lygus, the black fleahopper, the cotton fleahopper and cotton bollworms.

Pima County agent Blackledge and Survey Entomologist Moore report that several fields in the Marana area are being severely injured by the beet armyworm. Lygus and black fleahoppers are also causing injury to some fields and should be watched very closely.

Graham County agent Sears reports an average of 15 Lygus per 100 sweeps in long staple cotton near Solomon. He also reports that the black fleahoppers are building up in numbers over the entire county. Their injury is evidenced by small squares being blasted. In some fields, 25 or more black fleahoppers per 100 sweeps have been found.

Yuma County agent Chapman reports the following: Yuma Valley, 10-15 bollworms per 100 plants; Lygus and black fleahoppers running as high as 10 per 100 sweeps. On the Yuma-Mesa, 3-5 bollworms per 100 plants. At Dome, 5-15 Lygus or black fleahoppers per 100 sweeps, and as many as 10 bollworms per 100 plants. Wellton, 5-40 Lygus and black fleahoppers per 100 sweeps, and many cotton bollworm eggs present. In the Roll area, 5-30 Lygus or black fleahoppers per 100 sweeps; bollworm injury from large worms very evident.

Survey entomologist Moore reports the black fleahopper in Cochise County as follows: Kansas Settlement, an average of 42 per 100 sweeps; Stewart, 30; and Bowie, 20. He further reports that in Greenlee County black fleahopper counts are an average of 15. A grape Colaspis beetle is appear-

ing in some cotton fields in Greenlee County. Mr. Moore states that Lygus bugs continue to increase over the entire state, with counts averaging 15-20 per 100 sweeps. Spider mites show localized heavy spots in the Kansas Settlement area of Cochise County. Thrips continue to be heavy in the southeastern parts of the state, particularly in the Willcox area of Cochise County.

Agent Carter of Maricopa County reports fleahopper and Lygus populations extremely high in all sections of the county. When not controlled, these insects will destroy many squares and throw the plants into vegetable growth. As a rule, fields need to be dusted or sprayed when 16-20 fleahoppers or 5-6 Lygus per 100 sweeps are present. Many fields in Maricopa County are in this position at the present time, and the Lygus should be controlled. A few cotton bollworms are showing up and should be watched very closely. — J. N. Roney.

Cotton Insects on Move In West Texas Fields

STANTON, TEXAS—Early season cotton insects are building up in many West Texas cotton fields, according to reports from county agricultural agents.

Thrips and aphids are becoming numerous in Martin and Midland counties, while fleahoppers have also made a recent appearance. Most farmers have been watching their fields and will start spraying when conditions warrant it.

California on Lookout For Witchweed Presence

SAN FRANCISCO—The California Department of Agriculture has asked farmers to be on the lookout for witchweed (Striga asiatica), not known to exist in California, but a serious pest in North and South Carolina, where it is under quarantine. Last year infestations were reported on 2,185 farms in North Carolina and in six South Carolina counties.

Witchweed, a native of India and South Africa, is a parasite that obtains its food from host plants such as corn, sorghum, sudan-grass, sugar cane, crabgrass and other plants. Crop damage depends upon the degree of infestation, and may range from slight to complete crop failure.

According to officials of the Bureau of Rodent and Weed Control and Seed Inspection, this new plant pest is extremely difficult to control. A single plant may produce from 50,000 to 500,000 seeds. From observations made in South Africa, it is reported that witchweed seed may remain dormant in the soil for 20 years.

Although chemical sprays will easily control witchweed, the destruction of dormant seed in the soil presents an extremely difficult problem.

Since witchweed is not found in California at present, bureau officials said the best defensive method is to be on constant alert to find and eradicate any incipient infestations.

Insect Pests in Virginia Begin to Damage Crops

BLACKSBURG, VA. — Insect activity is beginning its build-up to a seasonal high. Arthur P. Morris, associate entomologist at Virginia Polytechnic Institute, reports that armyworms have caused heavy damage to some pastures, and are also present in rye, corn, and vegetable crops.

Controlling the alfalfa weevil this season has been successful, but in some untreated fields damage is heavy. Spittlebugs are also causing trouble in some oat, alfalfa and clover fields.

European corn borers are reported in some areas. There are no practical control recommendations in Virginia.

Periodical cicadas, more familiarly known as locusts, are appearing in parts of James City and Hanover counties. Control recommendations are available from county agents.

Southern Group Names New Officers for Year

HOT SPRINGS, ARK. — Dr. J. Frank Fudge, state chemist, Texas Agricultural Experiment Station, College Station, Texas, was elected president of the Association of Southern Feed and Fertilizer Control Officials at the group's 17th annual convention held here recently.

The new president succeeds Bruce D. Cloaninger, Clemson, S.C.

Bruce Poundstone, head, department of feed and fertilizer, Kentucky Agricultural Experiment Station, Lexington, Ky., was named vice president, succeeding Harold H. Hoffman, Tallahassee, Fla.

Maurice B. Rowe, supervisor, fertilizer, lime, motor fuel section, Virginia department of agriculture, Richmond, was re-elected as secretary-treasurer of the association.

Elected chairman of the group's executive committee was F. S. Carr, chief, food and feed section, Georgia department of Agriculture, Atlanta, Ga.

The executive committee will be comprised of the officers and two new committee members—L. C. Jacobs of Tennessee and Clyde A. Bower of Oklahoma.

COUNTY AGENT TOUR

MIDLAND, MICH. — The Dow Chemical Co. has announced its sponsorship of a study tour program for county agricultural agents. The program, designed to allow county agents to study agricultural innovations in various parts of the country, is being administered by the National Association of County Agricultural Agents. Twelve county agents from the North Central states will take part in the first tour under the program in July this year.

Calspray Names Midwest Sales Representative

RICHMOND, CAL.—The appointment of Paul W. Steinbrecher as an agricultural sales representative for the California Spray-Chemical Corp. was announced by W. J. Majure, district manager for the Great Lakes area, with offices in Maumee, Ohio.

Mr. Steinbrecher will work out of the Maumee office. He comes to Calspray with many year's experience in agricultural chemical sales. A native of Wauseon, Ohio, he attended Ohio Northern University.

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A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Western states.

Benefits of Agricultural Research Extend Over Broad Area of Scientific Advancement

CONVERSATIONS with people not directly associated with agriculture or the chemical industries which furnish products for agriculture show that many oppose continuing research in the field of plant nutrition and pest control. Their viewpoints seem to be based on the idea that "we are already growing more food than we can consume . . . why spend money on research to grow more?" It is surprising how many otherwise thoughtful people are being "brainwashed" by this attitude.

Some comments on the subject of agricultural research were recently uttered by W. E. Krauss, associate director of the Ohio Agricultural Experiment Station, before a group of entomologists. Dr. Krauss said that in addition to our categories of "basic" and "applied" research, we have a third: "pioneering research".

Pioneer researchers in the past often found that by-products of their work turned out to be more important than the data sought originally. Dr. Krauss illustrated this fact by reminding that Mendel probably did not realize that from his work on smooth and wrinkled seeds would come the basic laws of heredity. "Pasteur did not realize the far-reaching significance of his discovery that food exposed to the air would become contaminated with bacteria. Waksman probably never dreamed that his work in soil microbiology would lead to the discovery of streptomycin. Schalk never suspected that his work on sweet clover disease would pave the way for the discovery by Link of the chemical coumarin . . . for the treatment of coronary thrombosis and later a related chemical, Warfarin. Many bacteriologists had observed that molds could spoil cultures of microbes, but it took Fleming to show that a certain mold, penicillin, could kill varieties of disease-producing microbes at dose levels tolerated by man."

However, there are pitfalls to avoid in agricultural research, he points out. Although much success has been realized in solving agricultural problems, we must beware lest we develop "a beautiful veneer of superficial technological information concealing an infinite ignorance of the underlying processes and causes."

One such area lies in the changing scene of insecticidal materials. Here it is necessary to understand the physiological mechanisms through which the insect or plant may resist the working of toxicants. More and more research is necessary if we expect to keep ahead of diseases and insect pests as they become adapted to new crop varieties and new insecticides.

Benefits of agricultural research in the past have touched the lives of practically everyone. It has meant improved health through provision of an ample food supply capable of providing better nutrition for all. It actually has saved lives through the development of antibiotics and other protective materials. It also has helped in the adjustments required to meet rapidly changing conditions and it is in this area that new techniques will need to be developed.

"As we look ahead and anticipate the problem presented by an exploding world population, we must realize that there are even more monumental frontiers in science to be reached and that successive waves of new knowledge must be forthcoming as our advancing technologies absorb that which is presently known," the scientist said.

"It therefore becomes important to determine population trends and composition and the requirements of such populations over successive decades. At the same time, the dynamics of land use must be plotted. Probable human and mechanical resources will need to be estimated. Methods for long-term storage and preservation of foods and techniques for decontaminating food and water supplies and food-production areas following atomic or biological warfare will need to be developed.

"This kind of perspective leads only to the conclusion that the responsibilities of agriculture and therefore of agricultural research are as great and as much in the national interest as are those concerned with nuclear and space sciences. It simply suggests that if the same public interest were aroused and the same combination of public and private enterprise became effective, support for agricultural research would attain the same magnitude as that now being directed toward other areas of scientific endeavor.

"Biological science can continue to make healthy progress only if its task forces start with a comprehensive view of the problems in the field, keep the total perspective in view and do not lose it when they retreat into their various working quarters. This requires not only effort, but determination. The difficulty grows as the horizon widens and information grows in bulk.

It is essential to keep these facts in mind concerning agricultural research lest we be taken in by the "let's cut out research" philosophy.

Fertilizer Costs Up Only Slightly Since '49

THAT THE farmer of today is a businessman of very substantial means was emphasized in a talk by Earl F. Crouse, head of the Farm Business Council, at the recent National Plant Food Institute convention. He pointed out that there is nothing unusual at all for a farm operation to cover total financial resources of $250,000 and more. With farming units getting larger, the outlay becomes even more impressive with additional investments of from $30,000 to $50,000 in machinery and equipment being almost commonplace.

In speaking of the bargain the farmer gets when he purchases plant food, Mr. Crouse pointed out that the cost of fertilizer has risen very little over the past 10 years as compared to other items necessary for operation of the farm. We rather wish that Sen. Estes M. Kafauver (D., Tenn.) could have been on hand to hear some of these facts. It might have given him pause in his eagerness to cite the fertilizer industry for alleged "administered prices." If there is an industry in the country more competitive than the fertilizer trade, we would like to see it.

Sen. Kefauver, author of Senate Resolution 57 which authorizes the Subcommittee on Antitrust and Monopoly of the Senate Judiciary Committee to investigate the price structure of the fertilizer industry, might have been surprised to learn that prices paid by farmers for plant food today are only slightly higher than those quoted ten years ago and that the plant nutrient content of mixed goods has risen some 38% in that time.

He might also have learned something by listening in on casual conversations among industry people most of whom were voicing dissatisfaction at the price structure, condemning price cutters, and hoping that tonnage will remain high so the tiny margin of profit might expand a little.

Sen. Kefauver could well learn that he is barking up the wrong tree if he wants to accuse the fertilizer industry of raising prices in concert.

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CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop-area) basis with a mailing schedule which covers consecutively, one each week, four geographic regions (Northeast, South, Midwest and West) of the U.S. with one of four regional dealer issues. To those not eligible for this controlled distribution Croplife subscription rate is $5 for one year ($8 a year outside the U.S.). Single copy price, 25¢.

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Nov. 30-Dec. 5—Joint meeting, Entomological Society of Ontario; Entomological Society of Canada and Entomological Society of America, Hotel Sheraton-Cadillac, Detroit, Mich.

Meeting Memos listed above are being listed in this department this week for the first time.

July 1—Western Research and Education Committee, El Mirador Hotel, Sacramento, Cal.

July 6—Soil Improvement Committee, Pacific Northwest Plant Food Assn., Winthrop Hotel, Tacoma, Wash.

July 7-9—Regional Fertilizer Conference, co-sponsored by the Pacific Northwest Plant Food Assn. and state colleges and universities in the area, Winthrop Hotel, Tacoma, Wash.

July 15-16—Annual Fertilizer Conference, Cornell University, Ithaca, N.Y.

July 15-17—Southwestern Fertilizer & Grade Meeting, Galvez Hotel, Galveston, Texas.

July 29—Annual Kentucky Fertilizer Conference, Guignol Theater, University of Kentucky campus, Lexington, Ky.

July 31—Agronomy Field Day, University of California, Davis, Cal.

Aug. 3-7—Gordon Research Conference on biochemistry in agriculture, Kimball Union Academy, Meriden, N.H.

Aug. 12-13 — Northeast Fertilizer Safety School, Cornell University, Ithaca, N.Y.

Aug. 18-19—Midwest Fertilizer Safety School, National Safety Council Headquarters, Chicago, Ill.

Aug. 18-19—Annual Alabama Fertilizer Conference, Alabama Polytechnic Institute, Auburn, Ala.

Aug. 18-22—Annual Convention of the Canadian Fertilizer Assn., Bigwin Inn, Lake of Bays, Ontario.

Aug. 26-28—Soil Conservation Society of America, 14th Annual Meeting, Rapid City, S.D.

Aug. 30-Sept. 3—American Institute of Biological Sciences annual meeting, Pennsylvania State University, University Park, Pa.

Sept. 24-25 — Annual North-Eastern Fertilizer Conference, NPFI, Biltmore Hotel, New York, N.Y.

Sept. 30-Oct. 1—Fourth Southeastern Fertilizer Conference, Atlanta Biltmore Hotel, Atlanta, Ga.

Oct. 13-14—Western Agricultural Chemicals Assn., fall meeting, Villa Motel, San Mateo, Cal., C. O. Barnard, executive secretary.

Oct. 14-16—Pacific Northwest Plant Food Assn. Annual Convention, Chinook Hotel, Yakima, Wash.

Oct. 21-23 — National Agricultural Chemicals Assn., 26th annual meeting, French Lick-Sheraton Hotel, French Lick, Ind., Lea S. Hitchner, executive secretary.

Oct. 27—Seventh Annual Grassland Farming Conference, Extension Service, Rutgers University College of Agriculture, New Brunswick, N.J.

Nov. 4-6—Fertilizer Industry Round Table, Mayflower Hotel, Washington, D.C. Dr. Vincent Sauchelli, National Plant Food Institute, chairman.

Nov. 8-10—National Fertilizer Solutions Assn., Annual Convention, Statler Hilton Hotel, St. Louis; Muriel F. Collie, 2217 Tribune Tower, Chicago 11, executive secretary.

Nov. 9-11 — California Fertilizer Assn., 36th annual convention, Fairmont Hotel, San Francisco.

Nov. 16-20 — National Aviation Trades Assn., 20th annual convention, New Orleans, La.

Dec. 7-10—Central Canada and North Central Weed Control Conferences, Royal Alexandra Hotel, Winnipeg, Manitoba, Can.

Dec. 9-11—International Crop Protection and Pest Control Exhibition, Seymour Hall, St. Marylebone, London, England.

1960

Jan. 6-8—14th Annual Meeting, Northeastern Weed Control Conference, Hotel New Yorker, New York City.

PUBLISH SAFETY BULLETIN

LOS ANGELES—As part of an intensified safety program Collier Carbon and Chemical Corp. of Los Angeles is now publishing a bulletin, "Safety News." This bulletin, available to Collier personnel at all levels, to other members of the industry and dealers, is designed to emphasize the importance of preventive measures in minimizing the occurrence of accidents in the fertilizer industry.

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Trithion Granted Additional Tolerances

NEW YORK—Four additional crop tolerances have been granted by the U.S. Food and Drug Administration to Trithion, the insecticide-miticide developed by Stauffer Chemical Co. The recently issued tolerances include:

Undelinted cotton seed (0.2 ppm); onion (green or dry bulb) (0.8 ppm); cucumbers and summer squash (0.8 ppm); figs (0.8 ppm).

As a result of the new regulations, Trithion may now be used on cotton up to harvest time and on cucumbers, summer squash and figs up to 7 days of harvesting, Stauffer said. Tolerances have previously been established for Trithion on some 33 crops. It can also be used on several other crops where residues on edible parts are not a problem.

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